

# MARINE REVIEW.

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No. 1.

## Insurance Matters.

Mr. C. A. Prime and Capt. F. D. Herriman, representing the McCurdy-Prime insurance syndicate of Chicago and the Great Lakes Register, are in London adjusting with the English underwriters, whom they represent, the insurance business of the syndicate during the past season, and submitting also the rules that are to govern the classification of lake vessels in the register. It is a little early as yet to talk of insurance for 1898, but there is some speculation as to whether the Chicago syndicate has so fortified itself as to be in control this year of the large share of business which they had in 1897. It is not at all probable that the New York brokers, Johnson & Higgins, or the several firms in Buffalo, Chicago and Milwaukee, who have held general agencies for a great number of years, will rest content under the conditions that resulted in a heavy loss of business in the past year, and there is no telling what combination may be effected against the Chicago syndicate. The great collection of information regarding lake vessels that has been prepared for the new register is, however, an element of power in favor of the Chicago interest. The register will very probably be in print about the opening of navigation in the spring, but there is nothing definite as to whether it will be offered for general sale or only a limited number of copies printed for the special use of the interests that have compiled it. Little has been said of this classification of vessels of late, but work on it has been progressing steadily, both at the headquarters in Chicago and in the office of Walter Miller of Cleveland, who has had several engineers constantly engaged in making surveys of machinery. The surveys of both hulls and machinery, which include probably two-thirds of the lake fleet, and which can be more readily completed now that vessels are in winter quarters, go into more detail than has ever before been undertaken in connection with the publication of a register. Pending the publication of results of these surveys, the Chicago combination has the advantage of ready access to all of the information. They are at an advantage also in having the work done by surveyors who are working on salaries, and whose fees for wrecking jobs, wreck surveys, adjustments, etc., are all turned into a general fund.

## Transfer of the Hydrographic Office.

Senator Hale, chairman of the committee on naval affairs, has introduced in the senate a bill (No. 2754) authorizing the secretary of the navy to transfer the hydrographic office, now attached to the bureau of navigation, from that bureau to the bureau of equipment. On the strength of a letter from the secretary of the navy, asking that this transfer be made, the senate committee has recommended passage of the bill. The secretary says:

"It is the duty, at present, of the bureau of equipment to supply to ships nautical instruments and all other supplies pertaining to navigation, except charts and nautical books. The bureau of equipment also has charge of the naval observatory, the nautical almanac office, and the compass office. When the duties of the various bureaus of the department were assigned on the present basis by ex-Secretary Tracy, it was his desire to place the hydrographic office under the bureau of equipment. In fact, an order was issued to that end, but as it was subsequently ascertained that this transfer could not legally be made, the office has, up to the present time, remained attached to the bureau of navigation. It is my desire to place the hydrographic office under the bureau of equipment, in order that the latter may have charge of all work of a hydrographic nature. There is an intimate association of duties performed at the naval observatory, nautical almanac office, compass office and the hydrographic office. The chiefs of the bureaus of navigation and equipment recommend this action."

## Grain Fleet Scattered on Lake Michigan.

The grain capacity of vessels at Milwaukee, Manitowoc, Sheboygan and Gladstone is very close to 8,000,000 bushels. A large part of this tonnage will be furnished with grain at the ports named and will not be forced to go to Chicago for first cargoes in the spring. David Vance & Co. of Milwaukee have issued a card showing that there are at that port seventy-one vessels—fifty steam and twenty-one sail—capable of moving 4,730,000 bushels of wheat. Capacity of the steam vessels is 3,545,000 bushels, while that of the sailing vessels and barges is 1,185,000 bushels. The fleet includes a dozen vessels that are each capable of moving 100,000 to 175,000 bushels of grain. At Manitowoc there are forty steam and sail vessels capable of moving 2,350,000 bushels of wheat.

A few more vessels have been chartered in Chicago during the past week for storage of corn and delivery at Buffalo in the spring. The rate is said to be 2½ cents. Stocks of grain afloat and in store now at Chicago include 11,138,000 bushels wheat, 18,309,000 bushels corn, 1,383,000 bushels oats, 599,000 bushels rye and 813,000 bushels barley.

At Two Harbors, Duluth and Ashland contracts have been let for extensive improvements in ore shipping docks, all of which will greatly increase ore shipping facilities next season. It would seem that if 14,000,000 tons of ore is to be moved in 1898, there is need of considerable improvement in ore docks at Lake Erie ports. The facilities of the Carnegie interests at Conneaut will, of course, be greatly improved before the opening of navigation next spring, but additional machinery will certainly be required at ports other than Conneaut. The Pennsylvania Company is arranging for dock extensions at Erie, and the fast plant on the C. & P. dock, Cleveland, may also be enlarged, but nothing has been said as yet about expenditures for new work elsewhere on Lake Erie.

## Buffalo's Immense Grain Receipts.

Buffalo, the greatest grain port of the world, has handled during the season just closed more than 200,000,000 bushels of grain, in addition to 12,638,725 barrels of flour, and immense quantities of package freight, coal, lumber, iron ore, etc. The grain figures, which have been prepared by customs officials, are, of course, most interesting in the summaries of Buffalo commerce. Grain receipts of all kinds aggregated 201,651,280 bushels, divided as follows: Wheat, 56,142,718 bushels; corn, 57,741,741; oats, 65,482,925; barley, 14,823,919; rye, 7,459,977. If flour is included as grain (5 bushels to the barrel), the grand total of receipts is 264,844,905 bushels, exceeding the season of 1896, which beat all previous records, by nearly 50,000,000 bushels in the aggregate, and by 38,219,466 bushels actual grain receipts. Receipts of oats exceed by over 25,000,000 bushels those of 1896, this increase being more than the entire receipts of oats in 1895.

### AGGREGATE RECEIPTS OF FLOUR AND GRAIN AT BUFFALO.

	1897.	1896.	1895.
Flour, barrels. ....	12,638,725	10,384,184	8,971,740
Wheat, bushels .....	56,142,718	54,411,207	47,256,005
Corn, bushels .....	57,741,741	47,811,010	37,579,311
Oats, bushels .....	65,482,925	40,107,499	22,231,271
Barley, bushels .....	14,823,919	16,697,744	10,958,229
Rye, bushels .....	7,459,977	4,404,354	871,612
Total grain, bushels.....	201,651,280	163,431,814	118,896,428
Flour to grain, bushels.....	63,193,625	51,920,920	44,858,700
Gr'd total, grain and flour, bu.	264,844,905	215,352,734	163,755,128

In addition to the foregoing the receipts at Buffalo also included, during 1897, 5,391,887 bushels of flaxseed and 2,377,482 sacks of millfeed.

## Thirteen Millions of Freight at Five Ohio Ports.

Officials of the Cuyahoga customs district, which includes the ports of Cleveland, Lorain, Fairport, Ashtabula and Conneaut, all in Ohio and within a few miles of each other, have figured that the commerce of the district by lake during 1897 aggregated 13,620,076 net tons, valued at \$80,388,088, compared with \$66,045,868 in 1896, and \$65,822,398 in 1895. The great bulk of this business was, of course, in soft coal and iron ore, which are the principal commodities handled at all Ohio ports. Arrivals and departures of vessels in the district numbered 12,972, the registered tonnage of which was 14,245,741. The following table shows how the commerce of the district was divided among the different ports:

	CLEVELAND	LORAIN	FAIRPORT	ASHTABULA	CONNEAUT	TOTAL.
Net tons of freight, coastwise.....	5,841,954	637,193	1,672,837	4,366,537	596,441	13,114,962
Net tons of freight, foreign.....	274,919	43,740	.....	52,586	133,869	505,114
Total freight, net tons	6,116,873	680,933	1,672,837	4,419,123	730,310	13,620,076
Value of coastwise freight.....	\$47,282,774	\$1,838,312	\$15,296,750	\$10,997,507	\$1,464,616	\$76,879,959
Value of foreign freight.....	\$2,741,759	\$ 243,972	.....	\$137,162	\$ 385,236	\$ 3,508,129
Total value.....	\$50,024,533	\$2,082,284	\$15,296,750	\$11,134,669	\$1,849,852	\$80,388,088

A small business in grain by lake has been built up at Cleveland during the past two years. Receipts of wheat during the season just closed footed up about 2,500,000 bushels.

As had been expected, the different cities around the lakes that have been paying for dredging of all parts of their harbors within the government harbor lines are preparing to petition congress for funds with which to carry on this work. They are following up the demands made by Chicago in this regard, as they claim that if improvements are to be made by the general government in any of the harbors, all should be treated alike. Local authorities of Milwaukee are the latest to fall in line with a memorial to congress on the subject. They say that the work of providing 21 feet draft in Milwaukee harbor would necessitate the expenditure of a sum of money much larger than the city can afford at this time.

As a result of late receipts of coal at Milwaukee, some vessels making that port after Christmas, the total receipts for the season show an increase of 11,113 tons, for anthracite and bituminous combined, over the total for the season of 1896. The receipts of anthracite during 1896 exceeded those of this year by 166,958 tons, but the receipts of bituminous coal this year show an increase of 178,071 tons. The total receipts of anthracite during 1897 were 647,288 tons, and of bituminous 845,004 tons, making a total of both kinds of coal of 1,492,292 tons. The receipts of anthracite during the season of 1896 were 814,246 tons, and of bituminous 666,933 tons, or a total of 1,481,179 tons.

Stockholders of the Mutual and Menominee transportation companies (Hanna ships) met in Cleveland, Wednesday, and reelected old directors and officers.



### New York's Canal Scandal.

New York newspapers have all published lengthy editorials dealing with the canal question, and an investigation is demanded of the state legislature, which has just convened at Albany. The canals will again be a subject of first importance in the legislature. In discussing the report of the state engineer, which was summarized in the last issue of the Review, the Times says:

"The gravest public scandal that has been revealed in the affairs of this state since Gov. Tilden's exposure of the old canal ring in 1875 comes to light in the report of State Engineer Campbell W. Adams, in which he confesses that his estimate of the cost of deepening the canals, for which the people in 1895 voted to expend \$9,000,000, was millions of dollars out of the way; that the expenditure of the further sum of \$7,000,000 must be at once authorized if any benefit is to be had from the work already done and contracted for at a cost of \$7,121,812, and that this amazing state of affairs has been known in his office and kept from the public for nearly two years. Mr. Adams does not appear to appreciate the seriousness of his own situation, or the very great calamity his blundering will bring upon the state should canal improvement be abandoned or long deferred through the refusal of the people, once deceived, to authorize a further issue of bonds. A legislative investigation must be had. Campbell W. Adams, state engineer and surveyor, and George W. Aldridge, superintendent of public works, will be the persons on trial. The inquest must be honest. It must go to the bottom of the matter, and it must tell the truth in its findings. The people know that the canals have powerful rivals and foes in five great trunk railways. They will not

another dollar until the makers of it be exposed and the responsibility fixed. It would be a weak and dangerous policy to try to protect and whitewash the authors of this public calamity. That course would probably result in the refusal of a further grant of money, and in the ultimate ruin of the canals. We should suppose no political party would care to incur that risk and take that responsibility."

### New Guard Gates at the Sault.

The work of constructing large swinging guard gates, which will replace the movable dam above the locks in the St. Mary's Falls canal, is now actively in progress and will be completed before the opening of navigation. The removal of this dam is another step towards a material increase in canal draft next season. The cost of this undertaking, according to the Sault Ste. Marie News, will be about \$70,000. The work is being done by the government and not by contract. It involves the excavation of approximately 6,000 yards of rock for the gate recesses and the additional depth of canal at the point where the movable dam is located; the construction of the recesses, which will be of concrete; the building of two mammoth gates, each 32 feet high at the quoin posts and 61 feet in length, and the installation of machinery for their operation. The movable dam and its mitre sill, which were installed when the Weitzel lock was built and before 21 feet draft was contemplated, will be replaced before spring by these gates. In order to hurry the work, a force of about 150 men is being worked in two shifts of 8 hours each. An innovation in engineering work of this character will be the construction of



VIEW OF WHALEBACKS AT DULUTH AFTER A LAKE SUPERIOR TRIP IN DECEMBER.

be content with Mr. Adams' pitiful plea that "the state is not being robbed." Petty larceny is not the offense to be inquired into. The state expects to be robbed when a political machine takes charge of its public works. The question now is, has the canal system of the state been put in danger through incompetence and maladministration in the offices of the state engineer and surveyor and the superintendent of public works? Canal traffic is steadily dwindling. It fell off this year on the Erie canal 158,000 tons, as compared with 1896. The seven millions spent is sunk and lost until nine millions more are spent, of which \$7,000,000 must be borrowed by issuing bonds yet to be authorized by a vote of the people. As sure as fate the people will not vote another dollar to be spent on estimates prepared by Engineer Adams, who holds office until Jan. 1, 1899, or under the direction of George W. Aldridge, who will hold office until his successor is appointed. After the shock and the indignation of this exposure it may be impossible to get a vote for another bond issue. Meanwhile the canals will become less and less available for commerce, until finally the railroads have the field to themselves. If a deliberate plot to ruin the canal system had been devised, the method confessed to by the state engineer, with the sanction of Aldridge, would have occurred to any capable set of conspirators against the waterways that created New York city, and are still essential to its prosperity.

"But the matter is far too serious to become merely the source of party capital. The people have been grossly deceived; a great and costly public work has been begun improvidently and in ignorance, and the state must either spend \$16,000,000 for a work it was told would cost only \$9,000,000, or suffer a tremendous blow to its prosperity in the disuse and abandonment of the canal system, the people's only protection against extortionate railroad charges. It is useless to deprecate the making of a scandal and urge that the seven millions be given and no questions asked. The scandal is already made, and the people will never vote

the big gate recesses, into which the gates will swing when open, on either side of the canal, for which concrete will be used instead of cut stone. The use of concrete is not only a measure of economy, but at the same time it is expected will be more durable than stone. For this part of the work huge forms, that will be a counterpart of the gates on the outside surface, will be built up from the bottom of the canal on both sides. The finished side of these forms, which will be of wood, will comprise the outer surface of the moulds, the natural rock being the backing for the concrete which will be filled in between the two. The concrete for the work will be mixed in sheds alongside the canal. An ingenious arrangement of steam coils will keep the material warm enough so that it will set in the moulds before freezing. The gates will be the largest of the kind in the world. The width of the canal at the point where they are to be installed is about 108 feet, which is 8 feet wider than the new lock. The gates are being built of Oregon fir. Their upper portion for 8 or 10 feet will consist merely of open frame work, to permit of the natural flow of water when the locks are being filled. In case of accident to the lock sufficient of the flow would be shut off by the solid portion of the gates to prevent serious damage, and in case of necessity the open part of the new gates could be planked over without difficulty and the flow shut off entirely as with the movable dam now in use. It is proposed to keep the new gates closed when the locks are in operation. The type of machinery to be used in operating the gates has not yet been definitely determined upon, but it is altogether likely that electrical machinery will be used.

Another Howden hot draft contract is announced by the Dry Dock Engine Works of Detroit. The Bertram Engine Works Co. of Toronto will equip the steamer Tecumseh with this draft, in accordance with drawings and inspection by the Detroit company.



### Car Ferry Lines on the Lakes.

There are now in operation on the lakes twenty-three car ferries. Fourteen of these vessels are high-powered steam ice crushers, and two of them—the St. Ignace at the Straits of Mackinaw, and the Marquette, owned by the F. & P. M. Ry. Co.,—are the largest craft of their kind in the world. The number of these vessels connecting different railway lines on the lakes, especially on Lake Michigan, has increased wonderfully within the past few years. The combined capacity of the fourteen steam vessels is 287 cars, while the nine barges or floats, which are towed by large tugs, are capable of moving 145 cars. The capacity of the twenty-three ferries is, therefore, 432 cars. The summary of particulars of these car ferries, which appears on this page, was made up from a report published by the car service committee of the American Railway Association. This committee was called upon to prepare a similar table relating to car ferry lines in all parts of the United States, in order to determine the rate of compensation for borrowed cars when carried on boats.

### An Important Ruling on Limitation of Liability.

In the case of O'Brien vs. Miller, decided Nov. 29, 1897, by the supreme court of the United States, consideration is given to the limited liability act of the United States, and the "interest" to be surrendered in order that an owner may avail himself of its protection is held to include the award recovered for the loss of the vessel from another. Other questions were considered in the case, but this is the only one of general interest. The question arose in this wise: The Andrew Johnson, pursuant to charter, left Iquique for Hamburg, laden with a cargo of nitrate of soda. Coming into distress, she put into Callao, and made repairs as directed by a board of survey, and transshipped to the bark Mary J. Leslie a part of her cargo; this also on the recommendation of the board of survey. To meet the port of refuge expenses, the master of the Johnson gave a bottomry and respondentia bond on the Johnson, her freight and cargo, and also the cargo transshipped on the Leslie, the defeasance providing that it should be void, "if during the said voyage an utter loss of the said vessel by fire, enemies, pirates, the perils of the sea or navigation, or any other casualty, shall unavoidably happen." The Johnson was totally lost—by collision with the Thirlmere; the Leslie arrived safely, and demand was made on the transshipped portion of the cargo for the full

principle was recognized apart from any question of limitation of liability, as it was rendered prior to the passage of the act.

The conclusion of the court is "that the owner who retains the sum of the damages which have been awarded him for the loss of his ship and freight has not surrendered 'the amount or value' (sec. 4283) of his interest in the ship; that he has not given up 'the whole value of the vessel' (sec. 4284); that he has not transferred 'his interest in such vessel and freight' (sec. 4285). It follows that the ship owner, therefore, in the case before us, to the extent of the damages paid on account of the collision, was liable to the creditors of the ship, and the libellants, as such creditors, were entitled to collect their claim, it being less in amount than the sum of such proceeds."

The construction seems eminently fair, and in strict accord with the reason of the law. It may give rise, however, to some very interesting questions when the rights of underwriters under the subrogation clause come to be considered. In this case, the Johnson was insured, but "no allusion was made in the pleadings of the respective parties to the fact that the owners of the Johnson had received the benefit of any insurance upon the vessel."

### To Reconstruct Duluth Harbor Entrance.

Major Clinton B. Sears, United States engineer at Duluth, is about to let a part of the work of rebuilding the ship-canal entrance to Duluth harbor. The contracts will extend over several years, as the job is a very large one. On the 15th inst. bids will be opened on a section of the work which involves the construction of superstructure for the south pier. Both piers are to be rebuilt eventually, thus widening and generally improving the harbor entrance on a big scale. The entire length of the new south pier, which will be built first, will be 1,722 feet. The superstructure for this pier, on which work will begin early next spring, is to be completed Dec. 1, 1899, and will consist of timber cribs filled with stone and gravel, resting on piles cut off 22 feet below low water datum. The top of the cribs are to be 1 foot below low water datum. They are to be 24 by 36 feet and are to be built in lengths of 50 and 100 feet. The cribs are designed to support a massive superstructure of concrete masonry reaching 10 feet below low water datum and having a width of 20 feet at the base, with larger dimensions at the pierhead in the lake end of the structure, where the crib will also be larger—36 feet wide and 100 feet

### Car Ferry Lines on the Great Lakes.

Railroad or Owner.	Car Ferry Lines.		Length in miles.	Passenger or freight.	Equipment.						Capacity largest float or steamer.	Average daily number of cars ferried.	Length of time cars are on the floats or steamers.
	From	To			Floats.		Steamers.		Total vessels.	Total capacity.			
					Number.	Total capacity cars.	Number.	Total capacity cars.					
Ann Arbor.....	Frankfort, Mich.....	Gladstone, Mich.....	98	P. & F.	}		2	48	2	48	24		
“.....	Frankfort, Mich.....	Menominee, Mich.....	80	P. & F.									
“.....	Frankfort, Mich.....	Kewaunee, Wis.....	60	P. & F.									
“.....	Frankfort, Mich.....	Manitowoc, Wis.....	79	P. & F.									
Canadian Pacific.....	Windsor, Ont.....	Detroit, Mich.....	1	P. & F.	}	7	117	3 tugs	8	117	28	40	About 30 hrs.
Lake Mich. C. F. Trans. Co.....	South Chicago.....	Peshigo, Wis.....	240	F.									
“.....	Manitowoc.....	Benton Harbor, Mich.....	175	F.									
“.....	Sandusky.....	Detroit.....	56	F.									
Mich. & Ohio C. F. Transportation Co.....	Ludington.....	Manitowoc.....	56	P. & F.	}	2	28		2	28	14	30	9 hrs.
Flint & Pere Marq. Trans. Co. (F. & P. M. R. R.)	Windsor.....	Detroit (D. G. H. & M. Slip).....	0.5	P. & F.									
Grand Trunk.....	Windsor.....	Detroit (Wabash Slip).....	2	P. & F.									
“.....	Windsor.....	Detroit.....	2	P. & F.									
Michigan Central.....	Detroit.....	Windsor.....	0.5	P. & F.	}		3	63	3	63	21	907	10 mins.
“.....	Mackinaw.....	St. Ignace.....	8	P. & F.									
U. S. & Ontario Steam Nav. Co.....	Conneaut Harbor, O.....	Port Dover, Ont.....	68	P. & F.									
Chicago & West Mich. Ry. Co.....	Milwaukee, Wis.....	Muskegon, Mich.....	70	P. & F.									

amount of the bond. The demand was held good, and the amount paid.

Proceedings were instituted against the Thirlmere by the owners of the Johnson and cargo; the former was held at fault. The owners of the Johnson remitted to their underwriters their proportionate amount of the sum recovered from the Thirlmere. The present action was then brought against the owner of the Johnson to recover a due proportion of the sum paid on the bond, and it having been determined that he was liable for his average portion of the loss, aside from the question of limitation of his liability, the court said:

"The question is, Was he discharged therefrom by the loss of the Johnson and her cargo, although the owner has recovered and retains the sum awarded as damages against another ship for having brought about the loss? The answer of this question involves a consideration of the proper construction to be given the act limiting the liability of ship owners." After citing portions of the act (sec. 4282, et seq. R. S.), the court, Justice White delivering the opinion, said: "The clear purpose of congress was to require the ship owner, in order to be able to claim the benefit of the limited liability act, to surrender to the creditors of the ship all rights of action which were directly representative of the ship and freight. Where a vessel has been wrongfully taken from the custody of her owners or destroyed through the fault of another, there exists in the owner a right to require the restoration of his property, either in specie or by a money payment as compensation for a failure to restore the property. Manifestly, if the option was afforded the owners of the ship to receive back his property or its value, he could not, by electing to take its value, refuse to surrender the amount as a condition to obtaining the benefit of the act."

In passing the act, congress simply gave recognition to the general maritime law in that regard. The court in this case repeats its declaration in a former case, in which it was held that an owner need not account for his insurance in order to receive the benefit of the act, as that was a distinct and collateral contract, personal to the owner. The act was "in conformity with the general maritime law of Europe," and the court quoted from the Ordonnance de la Marine of 1681; the opinion of Pardessus (Droit Commercial, part 3, lith. 2, chap. 3, sec. 2); Kaltenborn (referring to the Consulate of the Sea, the law of Wisby, and the Hanse Towns), and the General German Commercial Code, art. 778, as supporting the construction given the act. Reference was also made to a decision of the supreme court, Sheppard vs. Taylor, 5 Pet., 675, where the same

long, and finished with a cut-water point. The new pier will be situated about 100 feet south of the present pier. With a shore end beginning at the government harbor line, it will pass through Minnesota point a distance of about 600 feet and thence out into the lake about 1,100 feet. The westerly 442 feet of the pier will curve to the south on a circular arc of 790.18 feet radius. The cribs are to be provided with an armor of 1-inch steel plate to a depth of 7 feet below the top along the channel face. A trench is to be dredged in which to place the cribs for the whole length of the pier to a depth of 26 feet.

An idea of the extent of the work as a whole may be gained from the following summary of approximate quantities of material contained in the specifications pertaining to the 1,722 linear feet of pier cribs: Oak timber, 222,168 feet; pine or hemlock timber, 3,766,208 feet; number of bearing piles, 2,745 feet; steel plates, 1,039,190 pounds; rivets, 23,182 pounds; machine bolts, 158,147 pounds; drift bolts, 545,824 pounds; cast washers, 42,527 pounds; cast block, 200 pounds; all this exclusive of rock and gravel. Then in accessory work the following are the approximate quantities: Pine or hemlock timber, 545,783 feet; round piling, 390 in number, 16,380 linear feet; flattened piling, 960 in number, 30,960 linear feet; drift bolts and boat spikes, 51,327 pounds; machine bolts, 14,690 pounds; cast washers, 5,000 pounds; rock for canal and protection piers, 30,000 tons; gravel for same, 10,000 cubic yards; gravel for stock pile, 15,000 cubic yards; dredging, 72,000 cubic yards; timber taken up and rebuilt, 20,000 feet; piling taken up and redriven, 3,000 linear feet. Provision is made for deductions if the work is delayed and for extra compensation for completion of the work in advance of the time specified.

Along the line of up-to-date practice in modern lake vessel construction, it is interesting to note an order just placed by F. W. Wheeler & Co. with the Bethlehem Iron Co. for hollow forged, oil tempered steel shafting, for the Bessemer steamer now under construction at West Bay City. The placing of this order redounds considerable credit to Mr. H. F. J. Porter and his work of educating lake vessel owners up to the use of the very highest grade of material. It also speaks well for the management of the Bessemer Steamship Co. in their determination to have nothing but the best of material in the construction of their vessels. The order was placed through the office of Mr. Walter Miller, who is agent for the Bethlehem Iron Co.



### Expenditures for Maritime Purposes.

OUR GOVERNMENT MORE LIBERAL TO BRITISH SHIPPING IN THE MATTER OF LIGHT-HOUSE DUES THAN IS THE BRITISH GOVERNMENT ITSELF—IN TONNAGE TAXES WE ARE MUCH MORE LIBERAL TO GERMAN STEAMSHIPS THAN IS THE CITY OF HAMBURG.

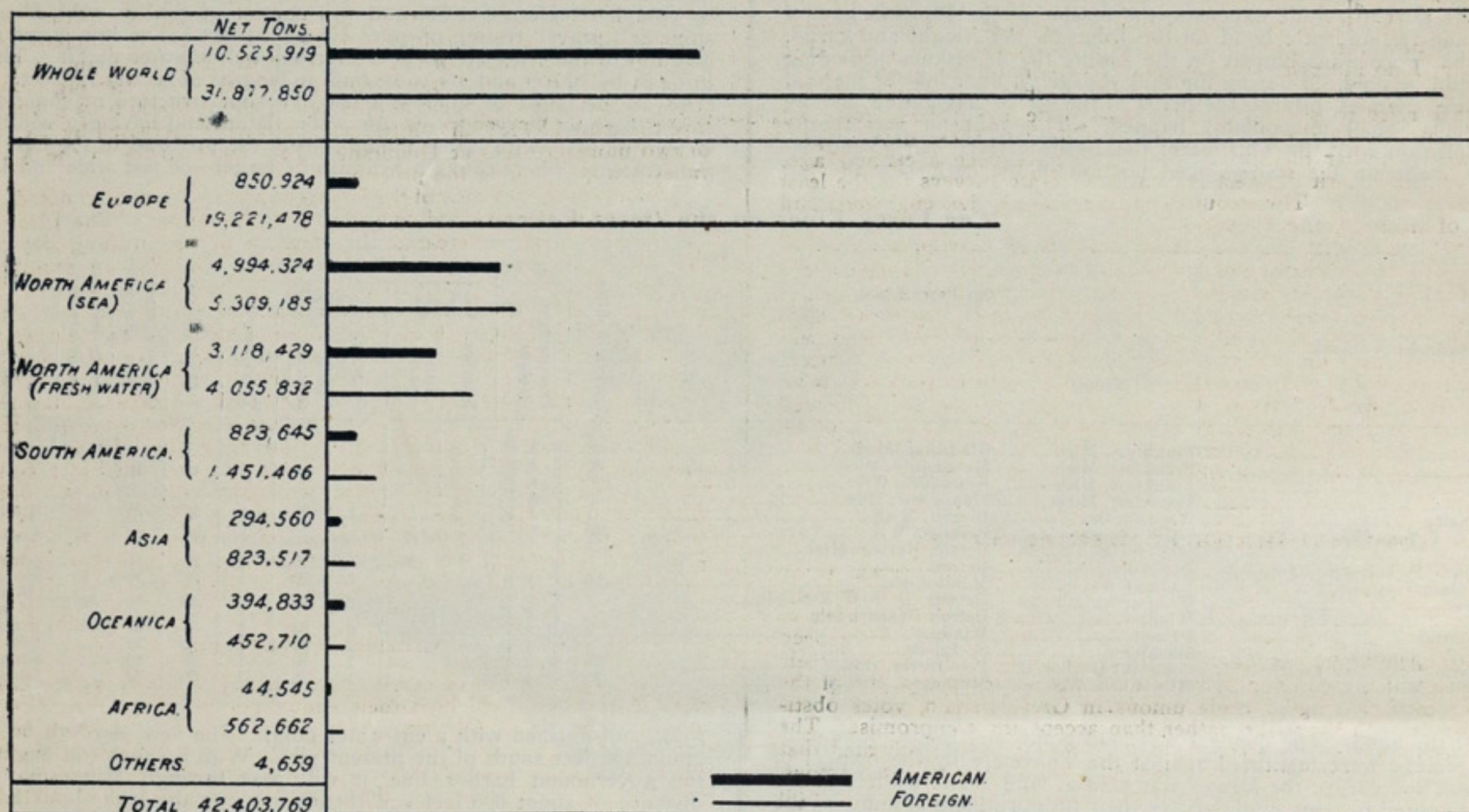
By EUGENE T. CHAMBERLAIN, United States Commissioner of Navigation.

The expenditures by the government of the United States for the benefit of navigation, domestic and foreign, in the waters of the United States amount annually, in round numbers, to \$20,000,000. For the last eleven years the sum devoted to river and harbor improvements has averaged \$13,500,000 a year. The expenditures for the light-house establishment and improvements now reach \$3,500,000 annually. To maintain the life-saving service \$1,500,000 a year are required. Annual appropriations for the coast and geodetic survey are \$400,000, and the present annual expenditures of the marine hospital service, including a partial national quarantine, are between \$600,000 and \$700,000. Certain other minor purposes of expenditure, bringing the total quite up to or beyond \$21,000,000, might be enumerated, but as these others are almost wholly for the benefit of American vessels, they are not included. With this total of \$20,000,000 spent annually should be considered the interest on the large investments we have already made. The value of the plant of the light-house service alone is estimated at about \$125,000,000. A few states make appropriations for canal maintenance and improvement; some municipalities maintain at public charge dock systems, and sporadic cases are recorded where legislatures and city governments have voted

gation, foreign shipping contributes only a share of the tonnage taxes levied for the maintenance of the marine hospital service. This contribution for the fiscal year ended June 30, 1896, amounted to only \$475,000, in round numbers, and for the last fiscal year to \$660,000.

By section 12 of the act of June 19, 1886, congress directed the president of the United States to invite foreign countries to cooperate with the United States in abolishing all light-house dues, tonnage taxes, or other equivalent tax or taxes on, and also all other fees for official services to, the vessels of the respective nations employed in trade between such foreign countries and the United States. While in form proposing the reciprocal abolition of charges on shipping engaged only between the United States and foreign nations, section 12, if generally accepted by maritime nations, would by this time have led to the virtual abolition of the charges referred to on all international shipping. The underlying idea was thus a philanthropic regard for the navigation of all nations, quite remarkable in view of the fact that at the time, or shortly after—in 1887-88—American vessels constituted only 3½ per cent. of the world's international navigation (A. N. Kiaer, *Statistique Internationale, Navigation Maritime*, Christiania, 1892, page 37,) while 50½ per cent. of that navigation was British.

A proposition from Great Britain that all nations should abolish all charges on shipping in foreign trade would be readily intelligible. British vessels undoubtedly pay out in foreign ports a sum annually larger than foreign vessels contribute toward the safety of navigation in British ports and along British coasts. Germany might, without considerable loss, make the same proposition. In 1886 the United States, as a maritime nation, had virtually nothing to gain by extending the invitation, and by abolishing years before light-house dues and reducing tonnage taxes



money for harbor improvements in addition to appropriations by congress. Navigation, however, broadly speaking, has become an object of federal expenditure.

When our annual expenditures for all purposes of about \$500,000,000, the great extent of our seaboard and of our inland navigable waters, and the needs of an increasing commerce are considered, this aggregate of \$20,000,000 expended for navigation is not large in proportion to the expenditures of other nations for similar purposes. In the United Kingdom, for example, the expenditures by harbor authorities, or from light dues, covering services substantially similar to those enumerated, and some others, amount annually, in round numbers, to \$25,000,000. The tonnage of vessels annually entering and clearing the ports of the United Kingdom in foreign trade is about double the tonnage of vessels annually entering and clearing the ports of the United States in foreign trade, for 1896 the aggregate being: United States, 42,403,769 tons; United Kingdom, 80,180,754 tons. The aggregate tonnage of the coasting trade of the United Kingdom for 1896 was 104,226,087 tons, and the total entries and clearances, foreign and coasting trade for 1896 combined, was thus 184,406,841 tons. Unfortunately the statistics of the coasting trade of the United States are not collected and compiled, though this work will hereafter be performed, but the aggregate water commerce of this country is undoubtedly greater than the aggregate for the United Kingdom just given.

The method of raising money to meet expenditures for the necessities and improvements of navigable waters in the United States is radically different from that in the United Kingdom. Although three-fourths of the tonnage in foreign trade entering and clearing ports in the United Kingdom is British shipping, vessels are taxed to maintain the light-house and life-saving services and for the improvement and maintenance of harbors. Although three-fourths of the tonnage in foreign trade entering and clearing ports in the United States is foreign, vessels are subject to no federal taxes for the light-house and life-saving services or for the improvement and maintenance of harbors. Of the \$20,000,000 annually expended by the government of the United States for the benefit of navigation,

much below those charged elsewhere had removed a practical inducement for other nations to accept the invitation. In so far as these charges may be regarded as payable by the ship rather than as a factor entering into the ultimate cost of cargo transported by it, the national advantage accruing from the abolition of such charges must be reckoned by the extent to which national vessels conduct the trade relieved from charges.

The tonnage of the combined entries and clearances at ports of the United States of vessels engaged in foreign trade amounted for the fiscal year ended June 30, 1896, to 42,403,769 net tons, of which 10,525,919 tons were American and 31,877,850 tons were foreign. The table presented herewith shows the proportions of American and foreign tonnage (combined entries and clearances) in the total trade by water between the United States and all foreign countries and between the United States and each continent. The trade between the United States and the rest of North America is subdivided into that by sea and that by fresh water or on the great lakes with Canada. The heavy lines indicate American, the light lines foreign tonnage.

So far as our foreign trade is concerned, foreign vessels make three times as much use of the results of our expenditures for improvements in navigation on the seacoast as do American vessels. As a rule steamships engaged in the transatlantic trade are those which call for the greatest depths of water in our harbors, and the ratio of foreign vessels engaged in this trade compared with American vessels is many times greater than 3 to 1. The voyages made to and from Europe by American steamships during the fiscal year 1896 numbered only 164, while the voyages made to and from Europe by foreign steamships numbered 7,116. The arrivals and departures of coastwise steamships, exclusively American, do much to restore the equilibrium between domestic and foreign vessels, but it is still true that if the United States pursued the same policy as Great Britain very much of the cost of constructing and maintaining light-houses, improving channels and harbors, and other benefits to navigation would be charged against the foreign shipping making use of these benefits, instead of being appropriated from the treasury. In the matter



of light-house dues the United States is much more liberal to British shipping than is the British government itself; in the matter of tonnage taxes we are much more liberal toward German steamships than is the city of Hamburg, for while a steamship has to pay tonnage tax at each entry into Hamburg, in American harbors after five payments such vessels are exempt for the remainder of the year.

The tonnage of the combined entries and clearances (with cargo) of France for 1896 amounted to 24,350,000 net tons, of which 15,900,000 tons were foreign shipping. The navigation dues imposed by France for the year amounted to 13,656,655 francs, of which foreign shipping paid approximately two-thirds. The bounties paid by France to French shipping amounted to 13,680,731 francs, by coincidence a sum almost exactly equal to the revenue derived from the various navigation dues, paid chiefly by foreign vessels.

In any general project concerning American shipping it is respectfully suggested that our present law in regard to tonnage taxes may properly be reviewed and the question be considered whether the large amount of shipping in foreign trade which enters and clears at American ports should not contribute something toward the maintenance of our light-house establishment and other federal aids and improvements to navigation.

### General Re-Survey of the Lakes.

Editor Marine Review:—In response to "Hydro's" article in your issue of Dec. 23, I beg to state that there is no objection on the part of the engineering profession to the legitimate work of the hydrographic offices. It is all right that naval officers should be kept ashore to tell the lake captains how many days in the year there was fog on Lake Superior, and where the greatest number of wrecks have occurred, and all that sort of thing. That is not part of an engineer's business. When it comes to surveying, however, engineers are directly concerned, and, in speaking of surveying, I do not refer to hydrographic reconnaissances, such as are good enough for Central America, and other little-visited parts of the world, but I refer to surveying such as is done by professionals, and which is by no means closely allied to navigation in these days of progress, however similar the two subjects may have been a century ago. The lake interests merit the best and most accurate surveys for the least expenditure of money. This requires the services of civil engineers, and not those of amateurs and dilettanti.

"Hydro" states that the old-school line officer no longer exists in the navy. This is a surprise and a source of great regret. Gone are the Joneses, the Decaturs, the Stuarts, the Perrys and the Farraguts, names that our country has been proud to honor. In their places we have Ensign Pull, Commander Swell and Commodore Guff; men who will stay ashore, even though our president announces that we need "officers to man the men-of-war now in commission." But perhaps they are right; it is possible, as "Hydro" states, that sea duty can be "better performed by civilian masters and mates," and I will not say that facts cannot be produced that will prove his assertion.

ENGINEER.

Washington, D. C., Jan. 2, 1898.

### The Great British Engineering Strike.

Ordinary methods of arbitration in the British engineering strike have been tried and have failed. The men, by almost an unanimous vote, have rejected the latest proposed compromise, which included a week of fifty-four hours instead of forty-eight, for which the engineers have been contending. After between five and six months of idleness, with their treasury exhausted, this large body of workmen, certainly one of the largest and most intelligent trade unions in Great Britain, votes obstinately to go on with the strike, rather than accept any compromise. The London Standard, after the strike had lasted four months, estimated that it had cost the country, with the strikes and lockouts in affiliated trades, not less than seventy-five million dollars. This estimate does not seem to be exaggerated. When the strike began, the trunk railways of the country at once suspended some of their mineral trains, the ship building industry became restricted in its operations, and the shop keepers in the affected districts found their trade falling away. These conditions have been intensified as the strike has continued. The engineering employers have had to refuse large contracts, which have been taken out of the country. The British ship building yards have been practically at a standstill, because of the non-delivery of armor plates, forgings, machinery and boilers. There has been an annoying check in naval construction. The most irritating thing about this aspect of the matter is that the strike has played directly into the hands of Germany. German exports of machinery have risen as those of Great Britain have fallen. In ship building especially Germany has found her opportunity. She has taken contracts away from England, and is able to undersell her British cousins in a department which they had been in the habit of regarding as peculiarly their own. Disastrous as these losses have been, the temper of the engineering employers is as unyielding as that of their men, and broad questions of business management, the employment of apprentices and freedom from the dictation of trade unions have entered into the situation and serve to make it more hopeless.

### Dismantled Ships and Disabled Machinery.

Editor Marine Review:—It has become necessary, for economy's sake, to dismantle nearly all of the steamers on inland waters and some of the consorts. Now a question arises as to the seaworthiness of these vessels, in view of the probability of machinery being disabled in bad weather, as in the case of the Idaho and Hale. What can be done to save life from these vessels or to save the vessels themselves when they are rendered helpless by loss of their steam power, or when, in the case of the tow barges, they are cast adrift in an open sea? This is an important question and should, in my opinion, be given thorough consideration by everybody interested in lake navigation. I have written this short inquiry in hope that the subject will be taken up and discussed in a manner suited to its importance.

ENQUIRER.

Ashtabula, O., Jan. 2, 1898.

### Encouraging Prospects in the Iron Trade.

In reviewing the iron trade of 1897 and the prospects for 1898, the Iron Age says:

"The year 1897 has been one of revolutionary changes. Possibly we do not yet fully recognize their power nor may we understand in detail their whole significance. Many may not yet have shaken off old lines of thought or modified convictions whose basis of fact has crumbled away. Are those justified who still believe in the periodicity of booms, in the return of periods of great profits? That there are some manufacturers and many traders who harbor a firm belief in them is certainly true. It is based, we feel sure, upon the full realization of the magnitude of our resources and a firm belief in our capacity to develop them rapidly and profitably. Who can say that the sanguine ones are not justified? But there is a rapidly growing conviction among our captains of industry that sudden fluctuations in the demand, and therefore in prices, are bound to become more and more rare, and that when they do come they will last a shorter and shorter time and will move within steadily narrowing limits. They argue that the maker and the distributor must rely more and more upon narrow margins, and that those are bound to go to the wall who drag along a precarious existence in the hope of recouping themselves for years of disappointment and sacrifices by jumping in early enough and getting out at the right time during a boom period.

"Generally speaking, the prospects for the new year are most encouraging. Indeed, it would be hard to find a single discouraging feature. With wheat at the dollar mark, the tariff policy settled for some time, a large tonnage already on the books of our large concerns, and stocks very light all over the country, it would seem that a good trade should set in early in 1898 and continue right through the year. By this we do not mean that there will be big prices, but everything points to a big tonnage and at fairly profitable figures. Pittsburg is emphasizing very strongly the supremacy of her position in the iron trade, and at the present time is turning out more than one-fourth of all the pig iron being made in this country, or on an average of about 60,000 tons a week. Before the close of 1898 this output may be further increased by the erection of two more furnaces at Duquesne. Two more stacks in the Mahoning valley are also among the probabilities of 1898."

Some special features of the Chicago iron trade are also noted. These are the conclusions regarding the western concerns: "The Illinois Steel Co. has so greatly increased the capacity of its finishing departments that they have practically no surplus billets. The Chicago iron and steel interests are now shipping more products, have larger orders on their books and are favored with a better outlook for the future than in the height of the season of 1895, when prices were booming. Yet values are on a low level, and those who look for an advance are quite moderate in their expectations. The indications point strongly to a universal conservatism dominating the trade. It seems that American manufacturers have tacitly agreed that a steady market with a narrow range of fluctuations is better than rapid advances and a serious unsettling of trade conditions. The Chicago iron trade is at last believed to be destined at a reasonably early day to achieve independence of distant coke supplies. Success is attending experiments in coking the ordinary Illinois coal. When this is demonstrated on a commercial scale the vicinity of Chicago will be the seat of manufacturing industries far surpassing anything now found there. Cheap coke of a fair quality is the one thing needed."

### Annual Conventions.

The organizations of captains and engineers, as well as the Lake Carriers' Association, will hold their annual conventions during the present month. The Lake Carriers' Association meets in Detroit, beginning Jan. 19. Conventions of both the American Association of Masters and Pilots of Steam Vessels and the Marine Engineers' Beneficial Association will be held in Washington, the former beginning Jan. 17. The annual meeting of the Ship Masters' Association this year will be held in Milwaukee, beginning Tuesday, Jan. 25. Officers of several lodges of the Ship Masters' Association elected recently are:

Cleveland—President, Richard Neville; first vice-president, William Benham; second vice-president, Claude Ennes; treasurer, Thomas Jones; financial secretary, W. W. Brown; recording secretary, Robert Pringle. Capt. Neville was elected delegate and Capt. Carleton Grover alternate to the grand lodge meeting. Capt. W. A. Collier, who is grand financial secretary, expects to get a large party together to go to the Milwaukee meeting.

Milwaukee—President, Henry Leisk; vice-president, John McCoy and Peter A. Anderson; secretary, John McSweeney; treasurer, F. C. Starke; marshal, Daniel Sullivan; warden, Fred Schwerman; chaplain, William Jamieson; sentinel, James Bruce; trustee for three years, James Leisk.

Toledo—President, Capt. Homer Durand; first vice-president, Capt. George V. Sage; second vice-president, Capt. James McKinley; secretary and treasurer, Capt. E. G. Ashley; delegate to the convention at Milwaukee, T. C. Herrick; alternate, Capt. George V. Sage.

Just as soon as an accurate list of vessels laid up at the different ports around the lakes is completed, it will be published as a supplement to the Marine Review. It is a mistake to hurry the preparation of a list of this kind, as vessels were shifting at Lake Erie ports, and between some ports on Lake Michigan, up to a few days ago, and correctness is of first importance in the publication of such information.

It is stated that the directors of the Hamburg-American line have invited tenders from the large German ship building companies for the construction of a steamer not only larger than the Pennsylvania and the unfinished Pretoria, but also of superior dimensions to the North German Lloyd Co.'s Kaiser Wilhelm der Grosse.

Army and navy charts of the lakes are kept in stock by the Marine Review, Perry-Payne building, Cleveland.





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The books of the United States treasury department on June 30, 1896, contained the names of 3,333 vessels, of 1,324,067.58 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes of June 30, 1896, was 383 and their aggregate gross tonnage 711,034.28; the number of vessels of this class owned in all other parts of the country on the same date was 315 and their tonnage 685,204.55, so that more than half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1896, was as follows:

	Number.	Gross Tonnage.
Steam vessels.....	1,792	924,630.51
Sailing vessels and barges.....	1,125	354,327.60
Canal boats.....	416	45,109.47
Total.....	3,333	1,324,067.58

The gross registered tonnage of the vessels built on the lakes during the past six years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30.	1891	1892	1893	1894	1895	1896	Total
Number of vessels.....	204	169	175	106	93	117	864
Gross tonnage.....	111,856.45	45,968.98	99,271.21	41,984.61	36,352.70	108,782.38	414,216.36

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC. (From Official Reports of Canal Officers.)

	St. Mary's Falls Canals.			Suez Canal.		
	1896*	1895*	1894	1896	1895	1894
Number of vessel passages.....	18,615	17,956	14,491	3,409	3,434	3,352
Tonnage, net registered.....	17,219,418	16,806,781	13,110,366	8,560,284	8,448,383	8,039,175
Days of navigation.....	232	231	234	365	365	365

\*1895 and 1896 figures include traffic of Canadian canal at Sault Ste. Marie.

At a cost of about \$600,000 the government will have on the lakes next season three new revenue cutters. They are good steel vessels of high speed, a credit to their builders and the men who designed them; but of what use are they? This question is often asked by the ship master, who smiles at the pomp and array of authority displayed by the young lieutenant who boards his vessel once or twice a year to examine a few papers. The days of smuggling on the lakes have passed, and if there were any smugglers they would not be caught by the revenue cutters. Their operations are on a very small scale, where they exist at all, and are confined to places where the shore lines of Canada and the United States are divided by narrow rivers and where the vigilance of the regular customs officials is fully up to requirements. That part of the revenue cutter patrol service which pertains to the examination of ships and their documents could certainly be performed by government officials ashore at an expense that would amount to practically nothing compared with the heavy expense of building and maintaining modern steam vessels. But it will be claimed that these cutters render assistance to disabled merchant vessels, and that they are often engaged in saving life and property. Reports to this effect are made annually by officials of the service, but the number of instances of assistance rendered by revenue cutters on the lakes of late are so rare that none of them can be recalled just now. Another claim is to the effect that these vessels could be used as auxiliary cruisers in time of war, but whatever may be said of them in this regard it is a fact that they are no better suited structurally for such purpose than the ordinary lake freighters, which would require no more alterations than the cutters to enable them to mount large guns, and which could be secured if necessary in large numbers. Within two or three years congress has authorized the building of seven steel vessels for this service in different parts of the country, and an effort is being made to replace the entire old fleet with costly modern ships. Authority is now asked for the construction of five new vessels for coast stations, but it would seem that the criticism of this service on the lakes will apply also to most parts of the coast. The money required to build these vessels could be used to far better advantage in other directions. As far as the lakes are concerned, there is certainly more reason in Senator McMillan's proposition that a modern cruiser be built to take the place of the antiquated Michigan. Senator McMillan's bill for this purpose has the endorsement of all officials of the navy department, and in this connection it may be noted that from records of the navy department it is learned that the Michigan is the oldest iron vessel in this country, and very probably the oldest in the world. She is an iron paddle steamer built by the government at Erie, Pa., in 1844. Alterations have been made several times, but the vessel in commission now is practically the same as she was when launched fifty-four years ago. Leading particulars of this old steamer are: Displacement with normal coal supply, 685 tons; tonnage, registered, 450; length, over all, 163 feet 2 inches; extreme breadth, 27 feet 2 inches; mean draft, 9 feet; horse power, 365; speed, 10½ knots.

Of twelve passenger vessels in the world that exceed a burden of 10,000 tons, eight are under the German flag and four belong to other countries—two to England and two to the United States. The vessels with their tonnage are: Kaiser Wilhelm der Grosse, German Lloyd, 14,000 tons; Pennsylvania, Hamburg-American, 13,000; Pretoria, Ham-

burg-American, 13,000; Kaiser Friedrich, German Lloyd, 12,500; Lucania, Cunard company, 12,000; Campania, Cunard company, 12,000; St. Paul, American line, 11,000; St. Louis, American line, 11,000; Barbarossa, German mail, 10,500; Bremen, German mail, 10,500; Friedrich der Grosse, German mail, 10,500; Konigin Luise, German mail, 10,500. Of the eight German ships every one, except the Pennsylvania, was built in the ship building yards of the German empire. The North German Lloyd Co. also intends building four more steamers of at least 10,000 tons when the new subsidy bill for mail boats shall have passed the Reichstag. When this is done there will be twelve German steamers of over 10,000 tons to the four now belonging to other governments. There will, however, then be one more very large British ship, the new 700-foot White Star liner building at Belfast, which will be considerably larger than the Kaiser Wilhelm der Grosse.

Contracts for two new steel steam yachts are announced from the east. One of them, which it is said will be the largest ever built in this country, is to be constructed by the Bath Iron Works, Bath, Me., and is supposed to be for Col. Oliver H. Payne. The other, designed by Gardner & Cox, will be built at the Roach yard, Chester, Pa., and will be about 150 feet in length, 20 feet beam and 12 feet moulded depth, with engines of 700 horse power supplied with steam from water tube boilers. The Bath Iron Works has just launched a composite light-ship of the first class. The frame of the vessel is composed of steel, with yellow pine planking, outside of which is oak sheathing covered with copper. The dimensions are: Length over all, 122 feet 10 inches; load water line, 113 feet; beam, 28 feet 6 inches; depth of hold, 13 feet 8 inches. There are two masts, each supporting four 100 candle-power lights. The engine is a single vertical, of 350 horse power, with 20-inch cylinder and 22-inch stroke, capable of producing a speed of 9½ knots an hour. Another contract just announced in New York is for a sea-going tug, the order going to the Columbian Iron Works of Baltimore. The tug is for the Consolidated Coal Co. of New York and will be 132 feet long, 27 feet beam and 16 feet depth of hold.

Fairplay of London summarizes the ship building returns of Great Britain for 1897. The launches numbered 791 vessels of 1,066,619 tons gross, and would have been much larger but for the engineers' strike, which caused the work in most of the engineering shops of the country to be practically suspended for over five months. In 1896 the launches were from private yards, 743 vessels of 1,257,339 tons gross, compared with 630 vessels of 1,028,708 tons in 1895, 622 vessels of 1,073,208 tons in 1894, 545 vessels of 868,783 tons in 1893, and 690 vessels of 1,160,400 tons in 1892. Many of the ship builders have had to put their men on short time in consequence of the hulls of the vessels being so much ahead of the engines, while others have entirely closed their yards on this account. The outlook for ship builders, when the present dispute has been settled, will be better than for some time, as almost every yard in the kingdom has at least twelve months' work in hand, and in some instances orders have been booked for vessels for delivery in the spring of 1899.

During her last trial run over a measured mile on the Hudson river, the steam yacht Ellide made the remarkable speed of 37.80 miles an hour. This places her far ahead of any steam yacht, large or small, in the world. The fastest steam vessel of any kind afloat today is the Turbinia, an experimental torpedo boat, propelled by the Parsons steam turbine, which has a record of 40.35 miles per hour. The Ellide is 80 feet long, 8 feet 4 inches beam and 3 feet 6 inches draught. She is of composite construction, with steel frames and scantlings and mahogany skin. The motive power is furnished by a quadruple expansion engine, with cylinders of 9, 13, 18 and 24 inches diameter and 10 inches stroke. The mile course over which the run was made was measured by the United States coast survey.—American Shipbuilder.

The secretary of the navy, in a communication to the senate committee on naval affairs, asks that congress will so modify the law as to the classification of navy vessels that it may be possible to observe it. Sections 1529 and 1530 apply to vessels that are now obsolete and to conditions for determining defensive strength that no longer prevail. Classification on the basis of displacement would be the most satisfactory, making first rates of all vessels over 5,000 tons, second rates over 3,000 tons, third rates over 1,000 tons, and fourth rates under 1,000 tons; torpedo boats, destroyers and submarine vessels to form special classes. Greater latitude should also be allowed the department in the assignment of officers.

In an address to the marine engineers of Detroit recently, Congressman John B. Corliss said that his opposition to the Detroit river postal service, and especially the construction of a vessel for the service, was based on the belief that appropriations for the river service would be deducted from funds needed for the regular service in the city of Detroit. Now that the river office is maintained from the general postoffice appropriation, he will be satisfied with any addition tending to betterment of the service. Mr. Corliss is also quoted as saying that he is opposed to the erection of a low bridge over the Detroit river, for the reason that he believes there will be a through water course between the great lakes and the Atlantic before many years shall have passed.

A Washington dispatch refers to a change in the engineer commissionership of the District of Columbia, and the name of Major T. W. Symons, United States engineer at Buffalo, is mentioned in connection with the place. The office is important, as three commissioners, acting together, exercise a power in the capital city similar to that of mayor in other places.

It would seem that the Parsons Turbinia Co., organized in England to construct vessels that will be propelled by steam turbines of the Parsons type, propose to enter extensively into the building of vessels, as they have purchased about twenty-three acres of ground at Wallsend-on-Tyne.



### Line and Engineer Officers of the Navy.

In his endeavor to conciliate the differences which have existed for years between the engineer corps and the line officers of the navy, Assistant Secretary Roosevelt has finally submitted to Secretary Long the report of the board of seven line officers and four engineer officers, which, with the assistant secretary as chairman, was commissioned to deal with the subject. As to results obtained, Mr. Roosevelt says:

"I am able without qualification to report to you that the bill that has been produced would, if enacted into law, be of literally incalculable good to the navy and would make our naval service the pioneer in the proper solution of problems, some of which are old, but some of which are so new that they have not yet been solved by any naval nation. The board recommends (a) that the line officers and engineers be amalgamated; (b) that when the number of officers to be promoted is so far in excess of the vacancies as to cause stagnation in the service, the requisite number of vacancies shall be caused by weeding out the men who are least fit to meet the heavy requirements of modern naval duty; (c) that the enlisted men aboard ship be given the same reward of pension and retirement enjoyed by their brethren who fight ashore, while the uppermost machinists are made warrant officers, to rank with the gunners and carpenters."

This problem is, of course, the most difficult of solution that naval secretaries have met with of late years, and there is doubt of congress taking any action in the matter. The conclusions of the board do not seem to have aroused enthusiasm in either faction of naval officers. One of the leading engineering publications, *Power of New York*, thus refers to the report:

"The board appears to have sacrificed the efficiency of the service to peace and goodfellowship in the ward room. The line has taken the engineer corps unto itself. The engineer officers will hereafter, if the plan carries, be required to do line duty, and will acquire the long-coveted actual rank and title. The line officers will also be required to do engineering duty to the end that every officer upon the ship may be able to serve either upon the bridge or in the engine room. In order that the engineering duties may not be too onerous for this hermaphrodite functionary, it is proposed that the 'machinists,' who are enlisted men, 'shall have more to do with running the engines.' This seems to be a case of the lion lying down with the lamb—inside of him. The line has always maintained that the actual care and operation of the engines required only practical mechanics, and that they could do what 'bossing' was needed. 'Success lies in limitation.' Efficiency comes from specialization. Perry and Farragut labored and shone in an altogether different field from Ericsson and Isherwood. The engineering of a man-of-war is a department of itself. It should be made to include and control the care and operation of all the machinery in the vessel. The chief engineer should have absolute authority in his department, should be responsible only to the chief officer or his direct representative, and not subject to annoyance nor interference from petty officers of the line. The number of engineer officers should be increased to meet the demand of the more numerous, more powerful, and more complicated vessels which the navy is acquiring, and the officers of the engineering department should have a positive and well-defined standing as regards rank and priority in keeping with the importance and responsibilities of their position. What they ask is positive rank with appropriate titles."

### Inflated Canvas Bags.

Readers of the Review will remember the attempts of lake wreckers to raise sunken vessels by means of inflated canvas bags, and will therefore be interested in this note from one of the Boston papers:

"People along the water front have followed with a good deal of interest the work that has been done toward raising the sunken schooner *F. A. Pike*, on account of a contrivance, novel to this part of the country, that has been tried on her. This is an arrangement of canvas bags which are placed inside of a sunken vessel, and by the inflation of which the vessel is supposed to be raised to the surface of the water. The contrivance is owned by a western company, and it is said that it has been used on the great lakes with a good deal of success, but the conditions there must be materially different from those that prevail in Boston harbor, for, although the people making the attempt have not had much to say about it, it is the general opinion along the water front that it has been a failure. The statement was made when the work was begun, that, when everything was in readiness, all that would be necessary would be to press a button, and the sunken vessel would come to the surface. Whether the button was pressed or not is not definitely known, but it is certain that the vessel is still at the bottom of the harbor, and that the people in charge of the wrecking expedition have discarded the canvas bags and gone back to the more primitive method of raising the vessel by means of chains stretched under the wreck between two lighters."

Another vessel of the light-house service, light-ship No. 67, stationed at the mouth of the Columbia river, broke away from her moorings a short time ago, and in trying to rescue her the light-house tender *Manzinta* of the Pacific coast narrowly escaped destruction. A line which was passed from the tender to the light-ship became disabled in the wheel of the latter and both vessels were on the verge of stranding before a second line was made fast between them. It is suggested by one of the Pacific coast marine papers that all of the light-house tenders, as well as the valuable light-ships which are now being built in this country, and which have steam power, should be fitted with towing machines and wire hawsers of the kind used extensively on the lakes. This appliance certainly seems necessary for complete outfitting of government vessels that are engaged in this kind of work.

Henry R. Worthington, finding their present enormous output of steam pumps inadequate to properly meet the requirements of their trade, are making enlargements which will enable them to increase their output over 30 per cent., especially in pumps of 10-inch stroke.

### New Bridge at Niagara.

What is said to be the longest span steel arch bridge in the world is now being erected at Niagara. It is to be built across the Niagara gorge on the site of the upper suspension bridge, and its span will be the greatest in the history of steel arch bridge building. Compared with it, the new steel arch recently completed for the Grand Trunk Railway, two miles below, will appear short. At the point where the arch is to stand the cliffs are 1,268 feet apart, and the suspension bridge now resting there seems but a slender thread from bank to bank. The abutments for the bridge stand close to the water's edge on either bank. They are four in number, two on each side, and the distance between the members of the pairs is 67 feet. These abutments were built two years ago, as it was thought that the new arch would be completed ere this, but the condition of the monetary and steel markets was not such as to inspire the company to proceed with the great and costly work until now. In the construction of the abutments much care was taken to make them most substantial. The loose earth and rock of the slope of the banks was excavated until a solid rock foundation was reached. This rock was then cut away in step form, and on the foundation so erected another foundation of concrete was built. Through this mass of concrete four long, heavy iron rods were run and securely fastened, their tops projecting several feet above the face of the concrete mass. It was on this concrete that the stone work of the abutments was built, the four rods and four others running through the stones in order that they might be held securely. The tops of all the eight rods project above the tops of the coping stones in order to afford a fastening for the bed plates of the legs of the arch, of which each abutment will support one. The stone used in building the abutments are all very large, and derricks of great strength were employed in letting them over the cliffs to the point of use. The north abutment on the New York state side of the river stands very close to the portal of the Niagara Falls Power Co.'s tunnel, and to protect it a strong retaining wall has been built. On the Canadian side the center of the new arch will rest exactly on the center of the present suspension bridge, but on the New York state side it has been found necessary to carry the center a little to the south of the present center of the suspension bridge in order that the abutments referred to may clear the tunnel portal. From these abutments or skewbacks the arch will rise, and the length of the arch proper will be 840 feet. The shore ends of the arch will be connected to the cliffs by trussed spans. This latest bridge will have but a single deck, the width of which will be about 50 feet. About 23 feet of its center will be taken up with double trolley tracks, on each side of which there will be carriage ways and walks, the latter to be slightly elevated. The width of the suspension bridge is but 17½ feet; thus the new arch will be nearly three times as wide. It is estimated that over 4,000,000 pounds of steel will be used in its construction.—*The Sun*, New York.

### Magnets for Raising Sunken Vessels.

Apropos of magnets for lifting purposes it is interesting to note that some one has suggested their application to the raising of iron and steel vessels sunk in deep water—too deep to admit of the employment of divers. One proposed scheme has for its object the raising of the ill-fated *Victoria*, of the British navy, which now lies at the bottom of the Mediterranean, in 450 feet of water, off the harbor of Tripoli. The weight of the wreck in water is estimated at 7,000 tons, and the suggested method of raising it is as follows: Powerful hydraulic rams and dynamo machines, and a series of heavy electro-magnets will be arranged on pontoons at the scene of the wreck. A magnet, lowered over the side and coming within reasonable distance of the sunken vessel, would be drawn toward the latter, and, on touching any iron or steel part of it, would immediately stick to it with a power of 100 tons. As each magnet made attachment, which would be indicated by means of an electric dial on the pontoon, a trial pull would be given to the rope to ascertain that a connection had been made to a firm part of the wreck. Should this not be the case, the magnet would come off, its position would be then slightly moved and a fresh attachment made until a firm hold had been taken of the wreck. When all the magnets had been thus fixed, the wreck would be considered ready for raising. Each lifting rope would be attached to the lifting pontoon by means of a sheave on the head of a hydraulic lifting ram having a stroke of 12 feet, which would give an effective lift of 24 feet. Each hydraulic cylinder on the pontoon would be in connection with all the others, and a balancing accumulator would prevent any rope getting more than a normal strain of 100 tons. When the rams had made their full stroke the lifting ropes would all be simultaneously held in position by means of special hydraulic lifting blocks. The rams would then be lowered and another lift of 24 feet given to the wreck, and the operation would be repeated until the wreck would be raised sufficiently near to the surface to be towed to shallower water and there beached. However, all this is, at present, simply in the nature of a suggestion, more interesting probably than practically valuable, especially as the roughly estimated cost of its execution runs up close to the \$500,000 mark.—*Cassier's Magazine*.

Three diplomas of merit to one concern shows pretty well what the judges of the Tennessee Centennial Exposition (held at Nashville in November) think of the Robertson-Thompson indicator, Lippincott planimeter and Eureka packing. Jas. L. Robertson & Sons, New York, entered these three articles and inform the Review they were awarded these prizes. Engineers and steam users will find interest and profit in sending for pamphlets describing and illustrating these goods.

Managers of the Riverside Worsted Mill of Providence, R. I., are making extensive improvements in their plant. Among them is the rebuilding of the boiler house, which is being constructed so as to have it absolutely fireproof. The walls are of brick, and the roof will have metal supports with a tile roofing. The contract for furnishing and erecting the iron work has been given to the Berlin Iron Bridge Co. of East Berlin, Conn.



### Around the Lakes.

A new spar deck of steel will be placed on the Inter-Ocean company's steamer Manchester during the winter.

William Lawrence, chief engineer of the steamer John N. Glidden, was drowned while ice-boating at Sandusky on Friday last.

Two new steam shovels, each having a dipper capacity of 2½ yards, have been purchased by the Duluth, Mesabi & Northern Ry.

It is estimated that the repair bill of the steamer Gogebic, which suffered damage by stranding on North Manitou island, will amount to fully \$8,000.

Sylvester Neelon, aged seventy, well known throughout Canada as a steamboat owner and government contractor, died suddenly at Toronto on Saturday of apoplexy.

The new dipper dredge that is being built by the Bucyrus Steam Shovel & Dredge Co. of South Milwaukee for Hingston & Woods of Buffalo will cost about \$60,000.

A bed plate for quadruple expansion engines of the new Bessemer line steamer building at Wheeler & Co.'s yard, West Bay City, was made recently at the Excelsior foundry of that place. It measures 26 by 13 feet and weighs 24 tons.

The Donnelly Wrecking & Salvage Co. of Kingston, has purchased the old side-wheel steamer Cambria, which went ashore last summer, and now lies at Port Huron. She ran between the "Soo" and Windsor. The vessel will be taken to Kingston next spring.

Mark H. Hanlon of Cleveland, who is well known to vessel men of the lakes, has undertaken a coal business on his own account. He has made favorable mining connections, and will next season give personal attention to the fueling of steamers by lighter in Cleveland harbor, as well as from the dock located just north of Main street bridge.

Officers of the Oswego branch, Marine Engineers Beneficial Association, elected recently, are: President, P. T. Perkins; vice-president, F. L. Axtell; recording secretary, James Donovan; financial secretary, Robert Cronley; treasurer and corresponding secretary, Thomas Navagh; conductor, S. T. Axtell; doorkeeper, John Donovan.

The management of the Cleveland Ship Building Co. is expecting to have the new 600-foot dry dock at Lorain ready to begin docking vessels in about two weeks. The dock is now said to be tight in all its parts, and the work of removing the cofferdam at the entrance will be undertaken during the present week. There are enough vessels at Lorain booked for the dock to keep it steadily employed until about the opening of navigation next spring.

On the evening of Jan. 19, opening date of the annual meeting of the Lake Carriers' Association in Detroit, the Detroit lodge of the Ship Masters' Association will give their fifth annual reception and ball. The entertainment committee of the Detroit lodge, of which Capt. M. G. McIntosh is chairman, has been reappointed and will use every effort to improve social features of the organization during the winter.

Georgia is the name by which the Goodrich line steamer City of Ludington, now undergoing a rebuild at Manitowoc, will be known next season. The steamer is in the stationary dry dock at Burger & Burger's ship yard, where she will be lengthened 15 feet and so generally rebuilt that she will be one of the best wooden vessels of the Goodrich line. New compound engines will be furnished by the Dry Dock Engine Works of Detroit.

The ability of the lake fleet to move the coal supply of the northwest up the lakes within six weeks after the close of a long strike in 1897, and that without disturbing other branches of the traffic, has convinced vesselmen that it will never again be possible to "bull" rates very high. How the 3,000-ton steamer is to compete with the new carriers is a question that will receive considerable attention at the annual meeting of the Lake Carriers' Association in Detroit, but it would seem that whatever may be done the 6,000-ton ship will make the rate.—Capt. J. S. Dunham, Chicago.

Major Symons, United States engineer at Buffalo, is somewhat disappointed that work on the rubble mound portion of the big breakwater at that point did not progress as rapidly as was expected during the past season. It was hoped that quite a line of this work could be finished, so that the action of the water on it this winter would afford some idea of its stability. This sort of breakwater is new to the lakes and may not prove all that is expected of it. There is a long stretch of it close to the top of the water, but the bad weather cut off the work at that stage of completion.

Although one of the Conneaut car ferries is now under lease at Milwaukee, owners of the vessels are planning to have both of them in service on Lake Erie again next season, running from Conneaut to Port Stanley, Ont., as well as to Port Dover. Hingston & Woods, dredging contractors of Buffalo, are said to have a contract for dredging at Port Stanley, which is to be completed early next season so as to admit of car ferry service at that point, which is nearer to Conneaut than the other Canadian port.

Capital stock of the Michigan & Ohio Car Ferry Co., recently organized in Detroit to operate between that city and Sandusky car floats of the kind that are towed by tugs, is \$200,000, divided into 4,000 shares of \$50 each, of which 1,000 are held as follows: E. H. Moreton, Detroit, 150; same, as trustee, 125; Charles S. Turner, Toledo, 150; same, as trustee, 50; Milo J. Turner, Toledo, 100; Frank E. Kirby, Detroit, 100; William C. Maybury, Detroit, 50; Walter Knight, Windsor, 25; J. W. Warwick, Cleveland, 188; W. T. Crooks, Detroit, 62.

Senator McMillan of Michigan will make a special effort to have passed at the present session of congress his bill for a cable from Glen Haven to the South Manitou island. When the steamer Gogebic stranded on North Manitou late in November, it was necessary, in order to secure assistance, to send a crew in a yawl to the mainland in a fierce northwest gale at a great risk of their lives, and in all the time operations for release of the vessel were being conducted the cable would have been of great service. Another argument in favor of the cable is the great desirability of being able to telegraph to the mainland the fact that vessels which have taken refuge from storms are safe.

### Will the Government or the Cities Improve Lake Harbors?

In accordance with the plan of trying to secure a big appropriation from the general government for improvement of the Chicago river, the commercial organizations and municipal government have adopted a memorial to congress asking for funds to provide a channel of 21 feet depth between deep water in Lake Michigan and the docks and wharves in the river. The scheme also involves the widening of the river, lowering of tunnels and removal eventually of all swing bridges, which are to be replaced by bascule structures. The first aim in Chicago is evidently to have the general government undertake the work of deepening and widening the river on a scale suited to accommodations for the largest lake craft, and then look to the city for the necessary changes in bridges. The memorial is a very strong document from a Chicago point of view, but it has served to direct the attention of newspapers in Buffalo, Cleveland and other places to the fact that Chicago is asking congress for an immense sum of money for river improvements, which in other places are made without assistance from the general government. As a result there will be general opposition in Washington to Chicago being especially favored in this regard. All of the Cleveland papers have already entered protest in lengthy editorials. The Cleveland Plain Dealer says:

"The fate of this memorial will be watched with deep interest by other ports on the great lakes. If the request is granted it will be immediately followed by similar memorials from the Lake Erie ports. There is no argument that can be brought in favor of the general government carrying deep water up the river at Chicago that will not apply with equal strength to the conditions at Cleveland, Buffalo and other places. At Cleveland the general government will not spend a dollar for deepening the channel in the river or keeping the channel at the present depth. The municipality has to keep dredges constantly at work, and for the widening and deepening of the channel inside of the government piers which is now going on the city pays every cent of cost. No doubt Chicago will present a strong case when it makes its application to congress. It may be sure, however, that other lake ports will be able to put up one equally strong, and will not fail to do so if Chicago success furnishes a precedent. When there is actually 20 or 21 feet of water throughout connecting channels of the lakes, it will be necessary to deepen the harbors if full advantage is to be taken of the deep draft, for none of the great harbors has that depth now at the principal docks. The question presents itself whether the necessary work in continuation of the government deep water channel shall also be done by the general government, or by the ports themselves as heretofore. There is much to be said on both sides, but we fancy congress at this session will not be very well disposed towards the new departure desired by Chicago."

But the opposition of other lake ports is not the least of Chicago's troubles in trying to solve this problem. The city is divided as to the advisability of undertaking big expenditures for improvement of the river. The River Improvement Association has shown that the scheme of immense lake front docks is visionary and a matter of the distant future, and that the claim of great delays to business within the city on account of the bridges is exaggerated, but now they are met with an argument in favor of diverting the great bulk of business to South Chicago, where a great harbor of natural advantages has already built up an immense commerce. Capt. E. S. Chapin, United States army (retired), writing to one of the Chicago papers on the subject of the city transferring its efforts to the upbuilding of South Chicago, says:

"The enthusiastic advocates of river improvement will tell you that a few hundred thousand dollars will lower the tunnels 4 feet, and a few more hundred thousand will replace turning bridges by bascule bridges, remove center piers, etc., and so it foots up two or three millions; and there you are. And so you are, in a sense; but, on the other hand, you are nowhere, for the problem is not solved; the result is not obtained, and unless it be your work is thrown away. Without going into all the details of figures on each item, it is enough to say that a conservative estimate of the expense of lowering tunnels, changing bridges, removing center piers, and condemning property necessary to the increased width foots up a total of over \$43,000,000, and this amount will be exceeded rather than reduced. But where in the wide world can anybody be found whose interest it is to put up this money for these purposes? And till such parties be found where is the use of disputing whether it will cost \$4,000,000 or \$44,000,000? It is no proper charge for a river and harbor bill, so the general government can't touch it. The property-owners won't pay a bonus for having their property cut in two or confiscated bodily. The city can't undertake it. The city has its hands full with the drainage canal."

H. I. Crandall & Son, marine railway builders of East Boston, are about to begin work on a new marine railway of their improved type at Lunenburg, N. S., which is intended mainly for the local fleet. There will be two cradles on one track, the upper one detachable. The work will be completed about April 1.

All charts sold by the Marine Review are corrected to date of sale.

A one-sixteenth interest in the Steamer Louisiana, belonging to the estate of Walter B. Scott, deceased, will be sold at auction on Monday the 24th day of January, 1898, at court house, northwest cor. Public Square, Cleveland. She is a wooden steamer built at Marine City, Mich., in 1887; 267 feet long, 1,250 net tons, and rates A 1\* in the Inland Lloyds.

H. W. KITCHIN, Admr.

U. S. ENGINEER OFFICE, DULUTH, MINN., Nov. 30, 1897. Sealed proposals for building substructure for south pier, Duluth Ship Canal, will be received here until noon, Jan'y 15, 1898, and then publicly opened. Information furnished on application. Clinton B. Sears, Major, Engrs. jan. 15



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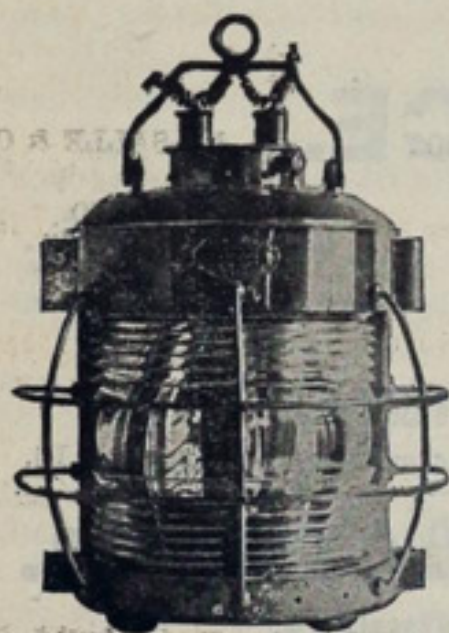
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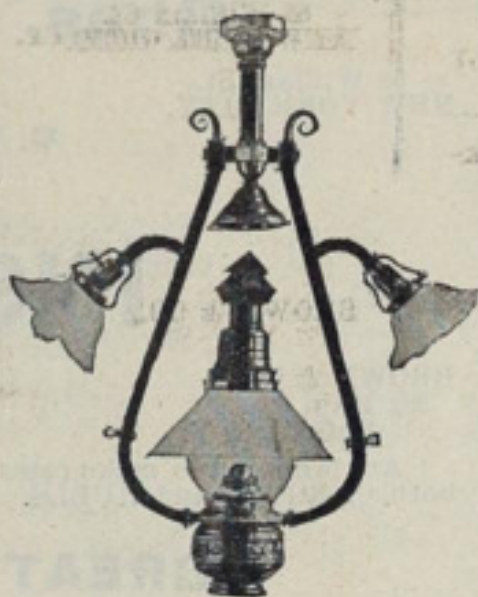
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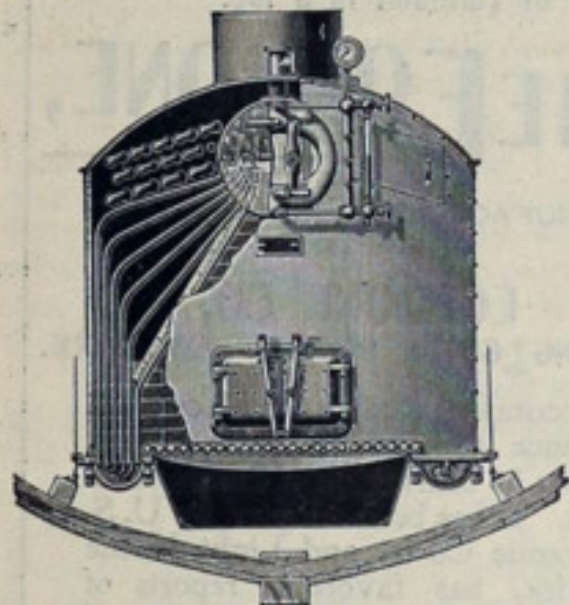
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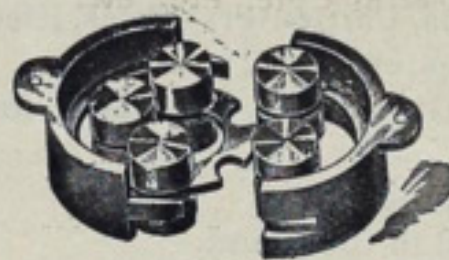
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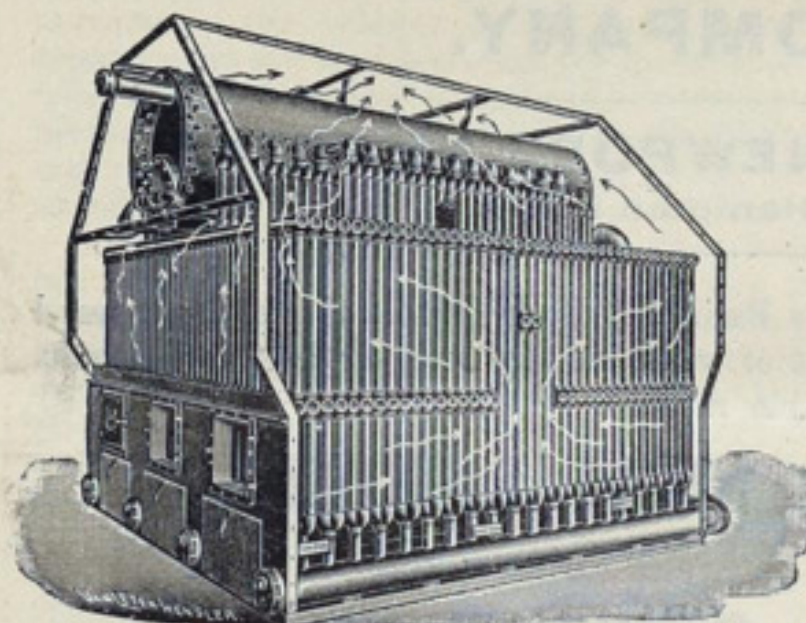
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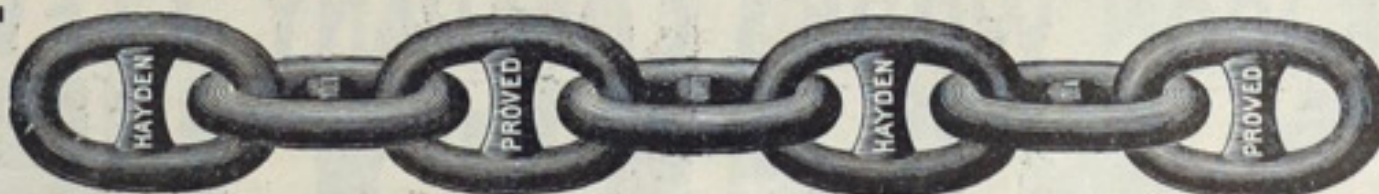
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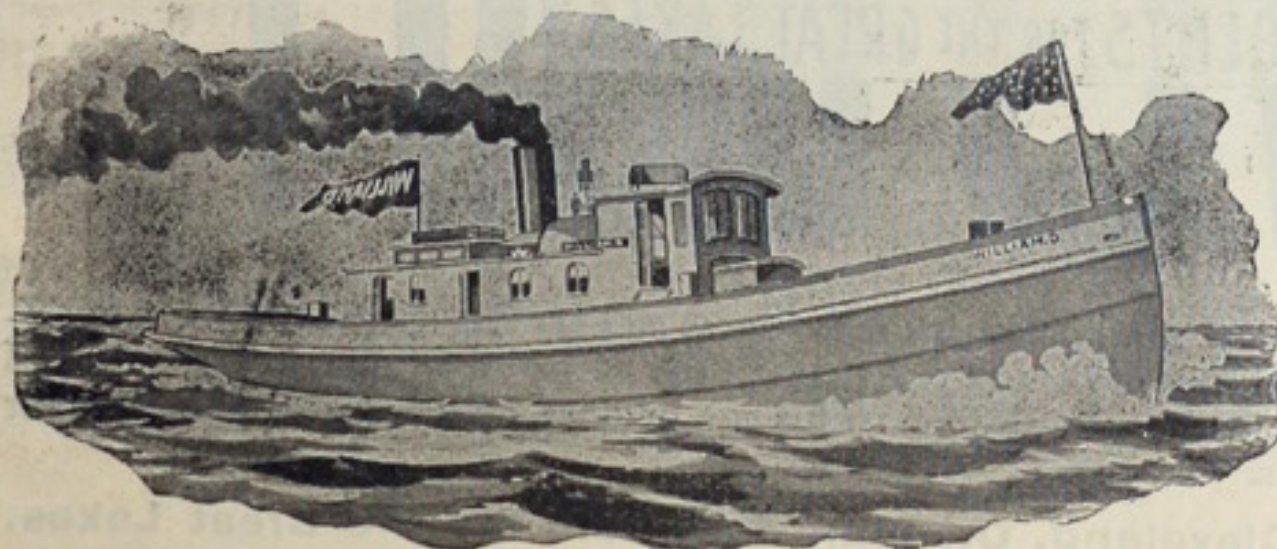
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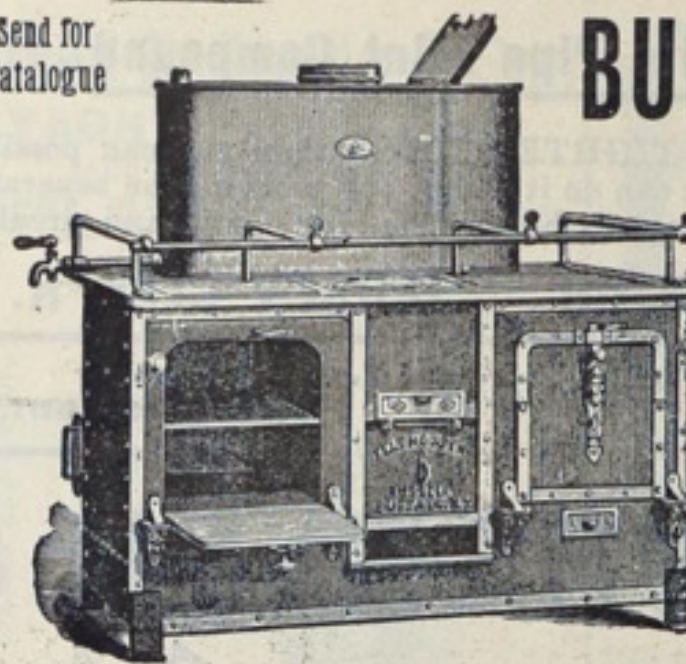
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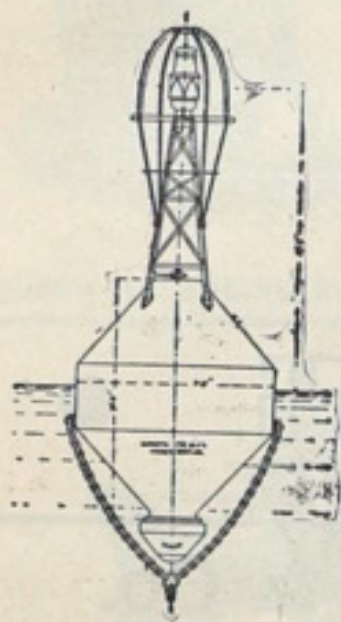
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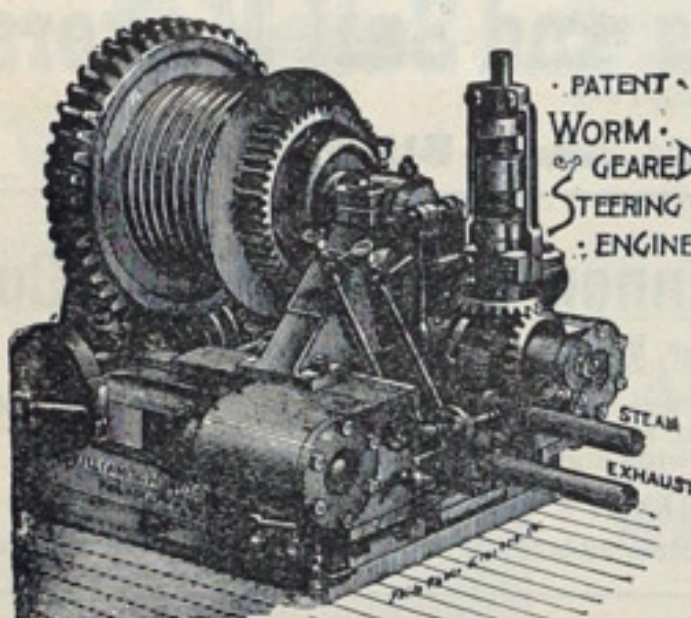
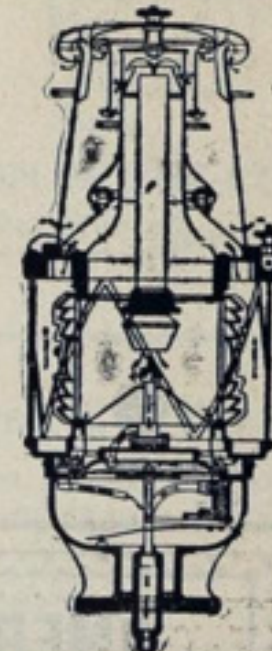
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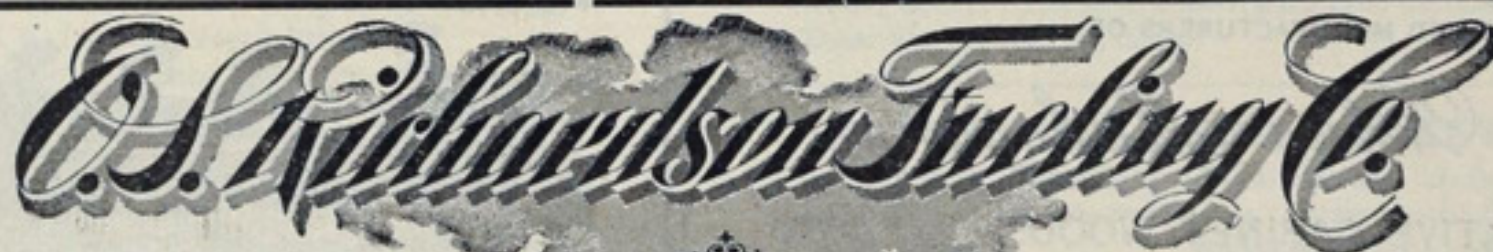
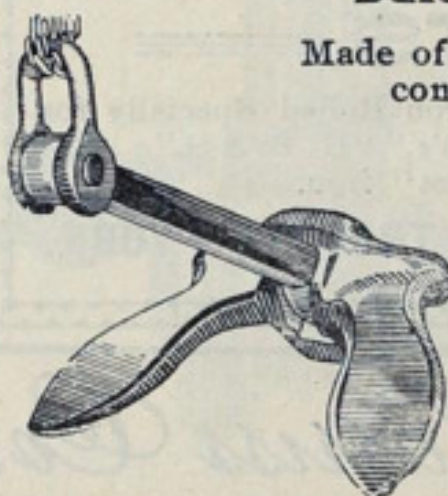
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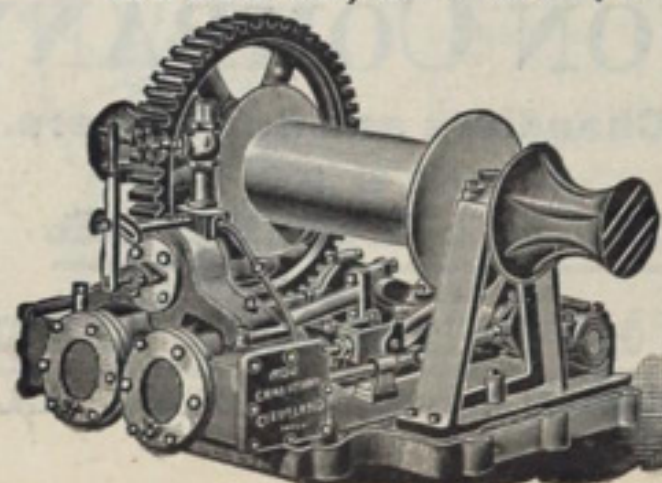
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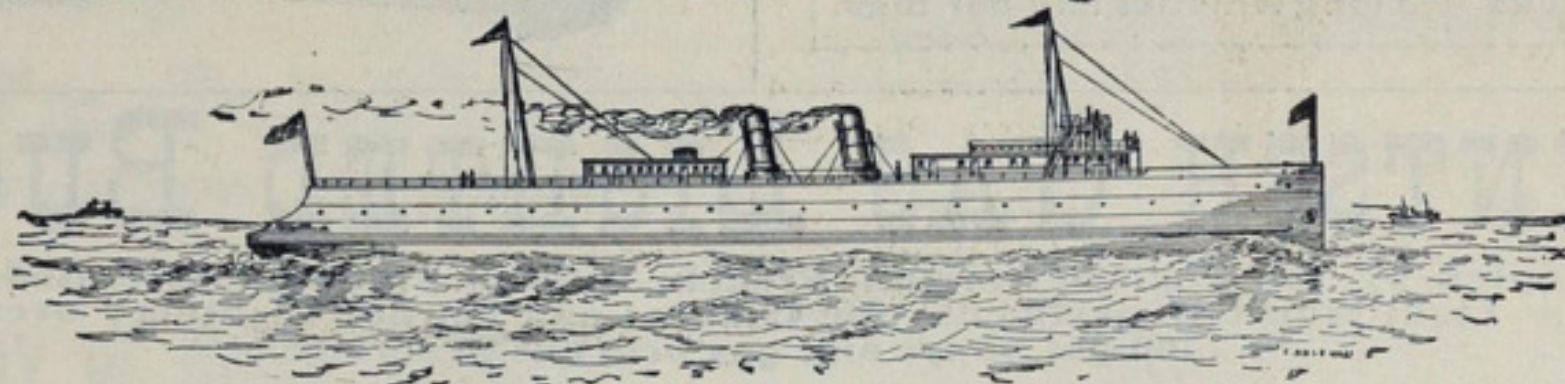
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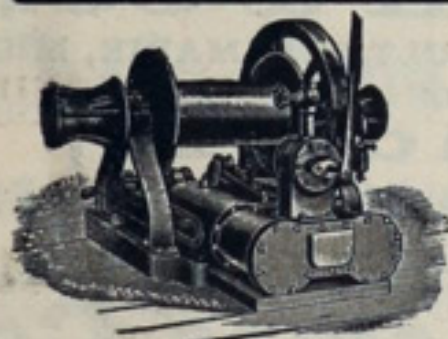
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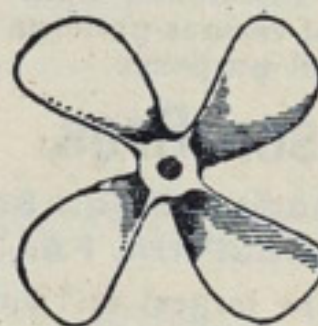
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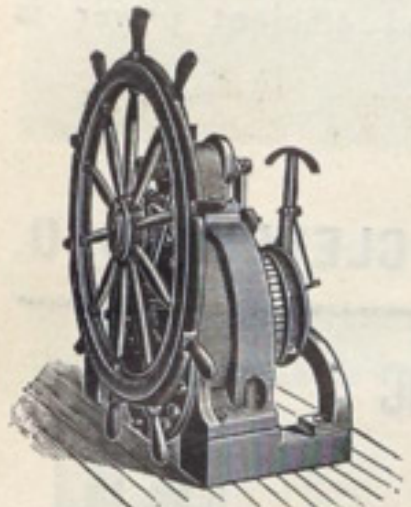
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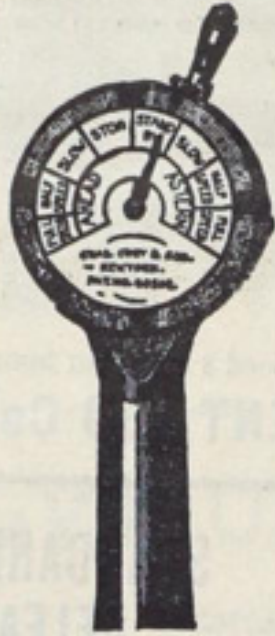
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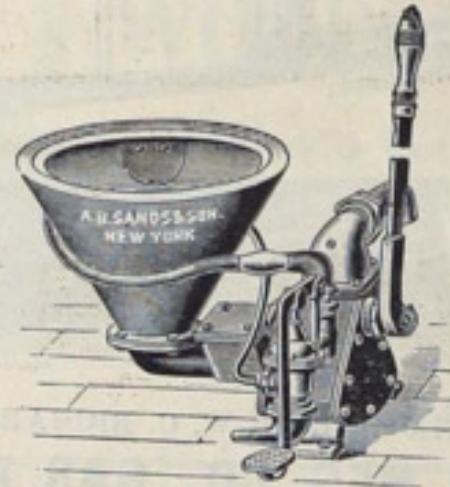
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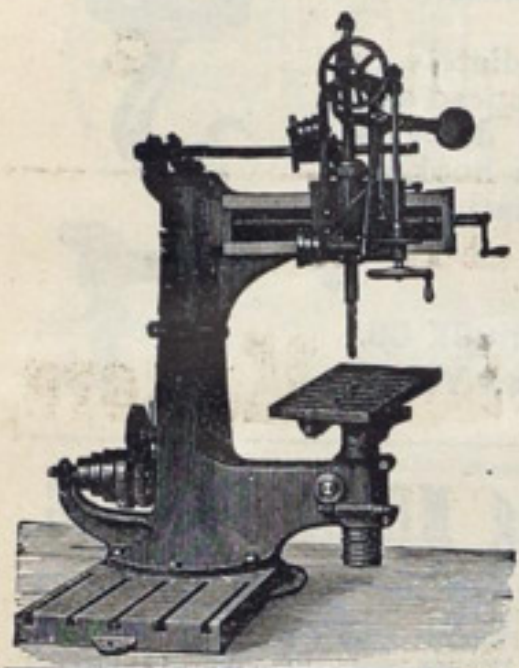
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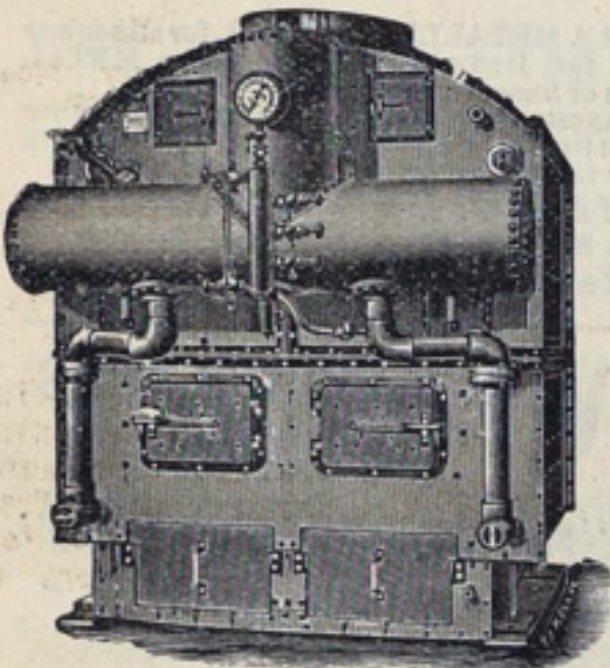
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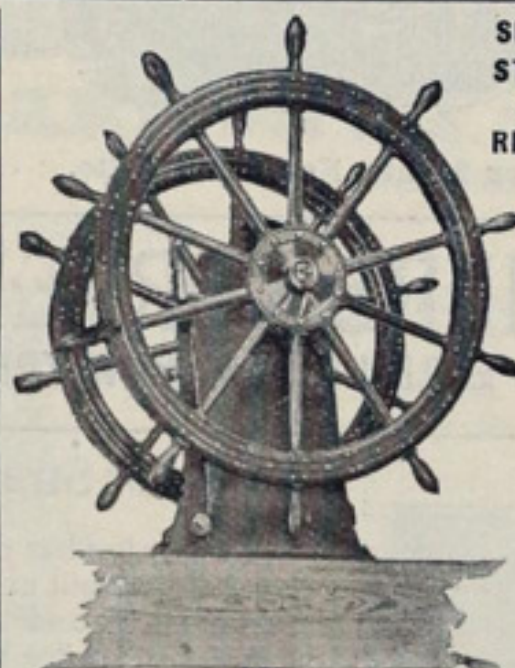
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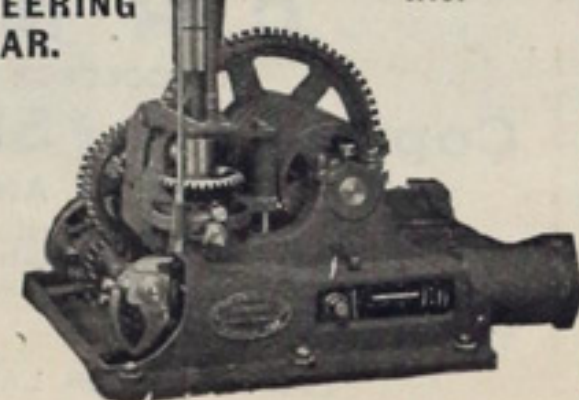


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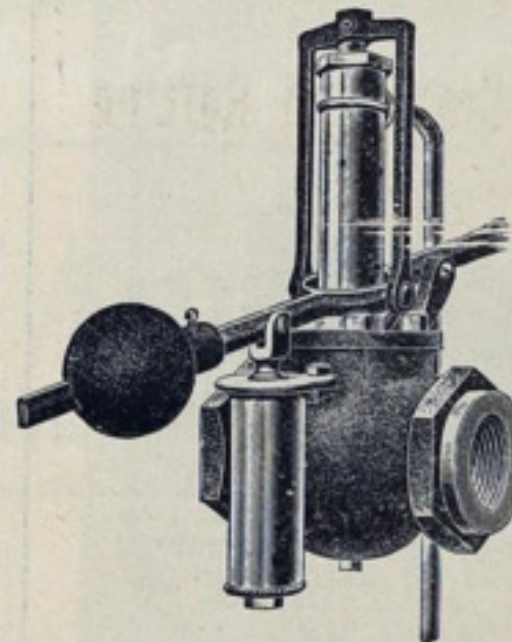
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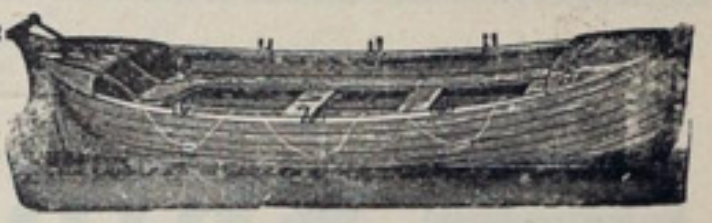
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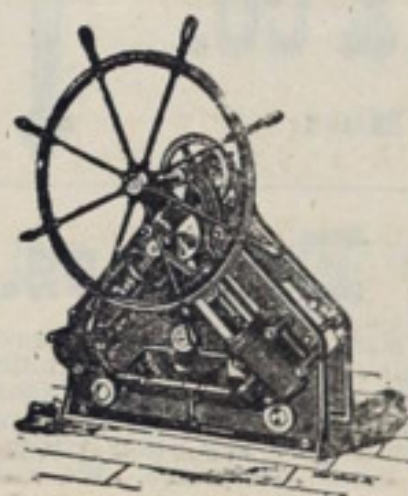
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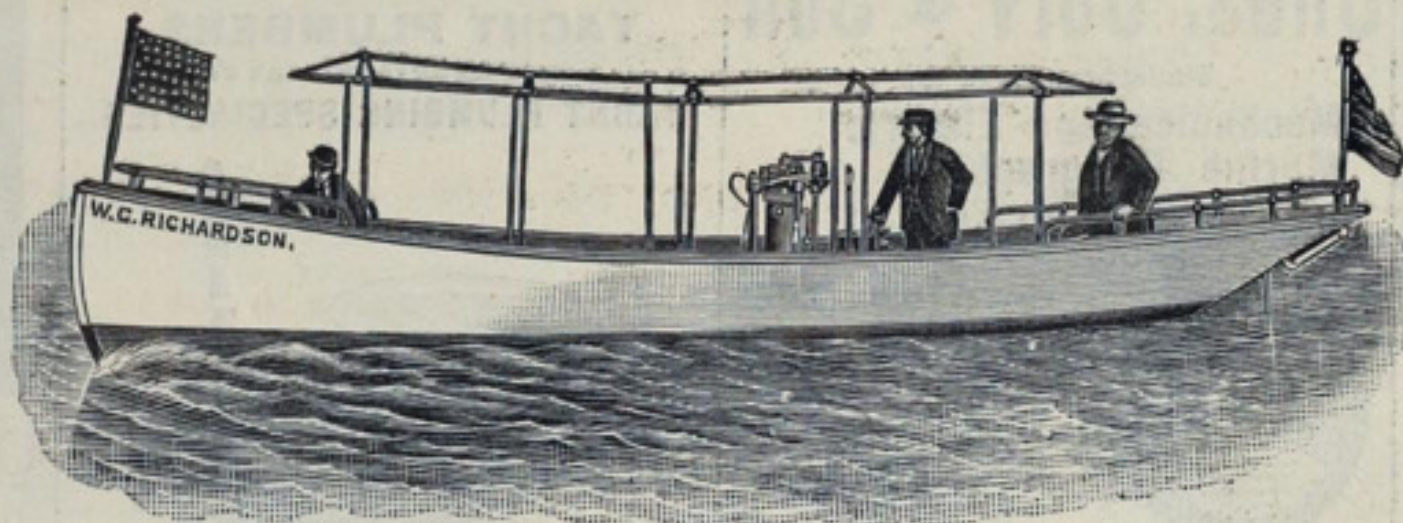


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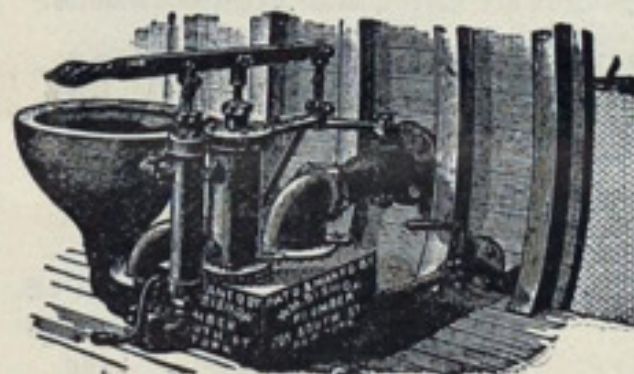
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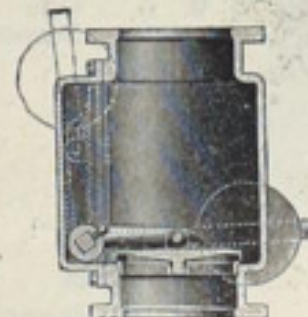
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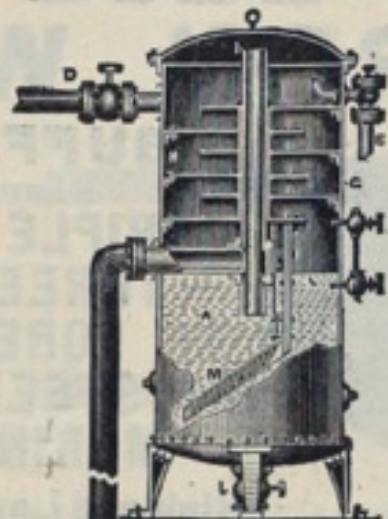
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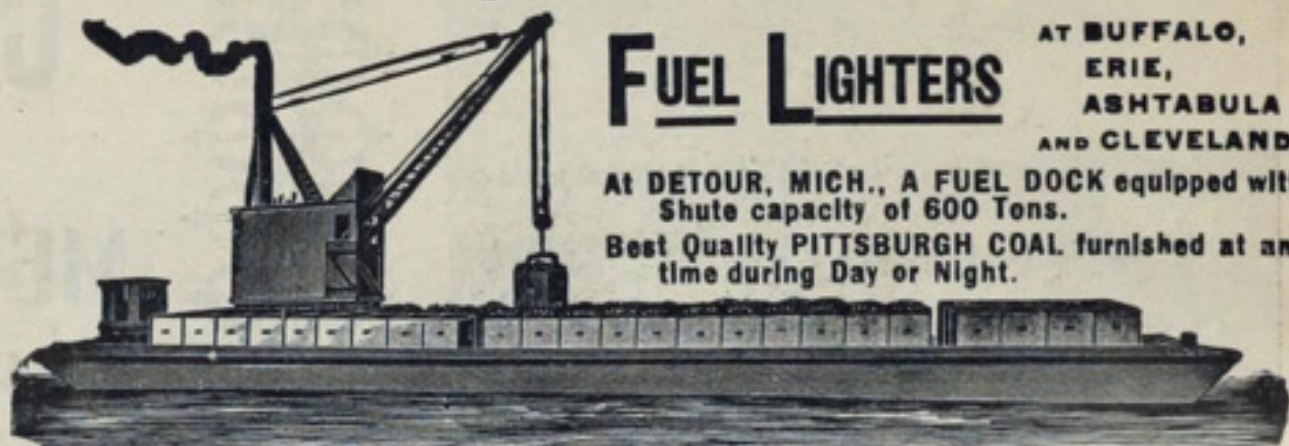
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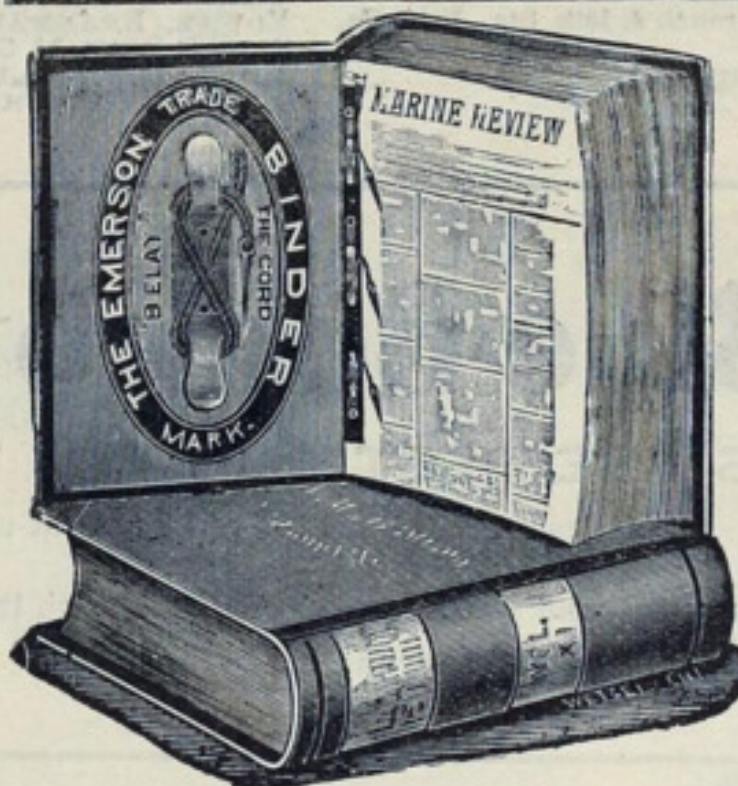
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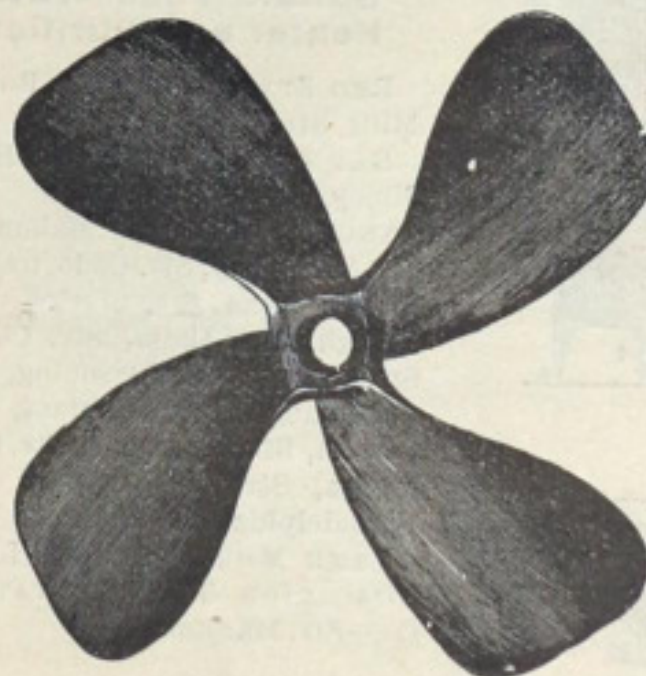
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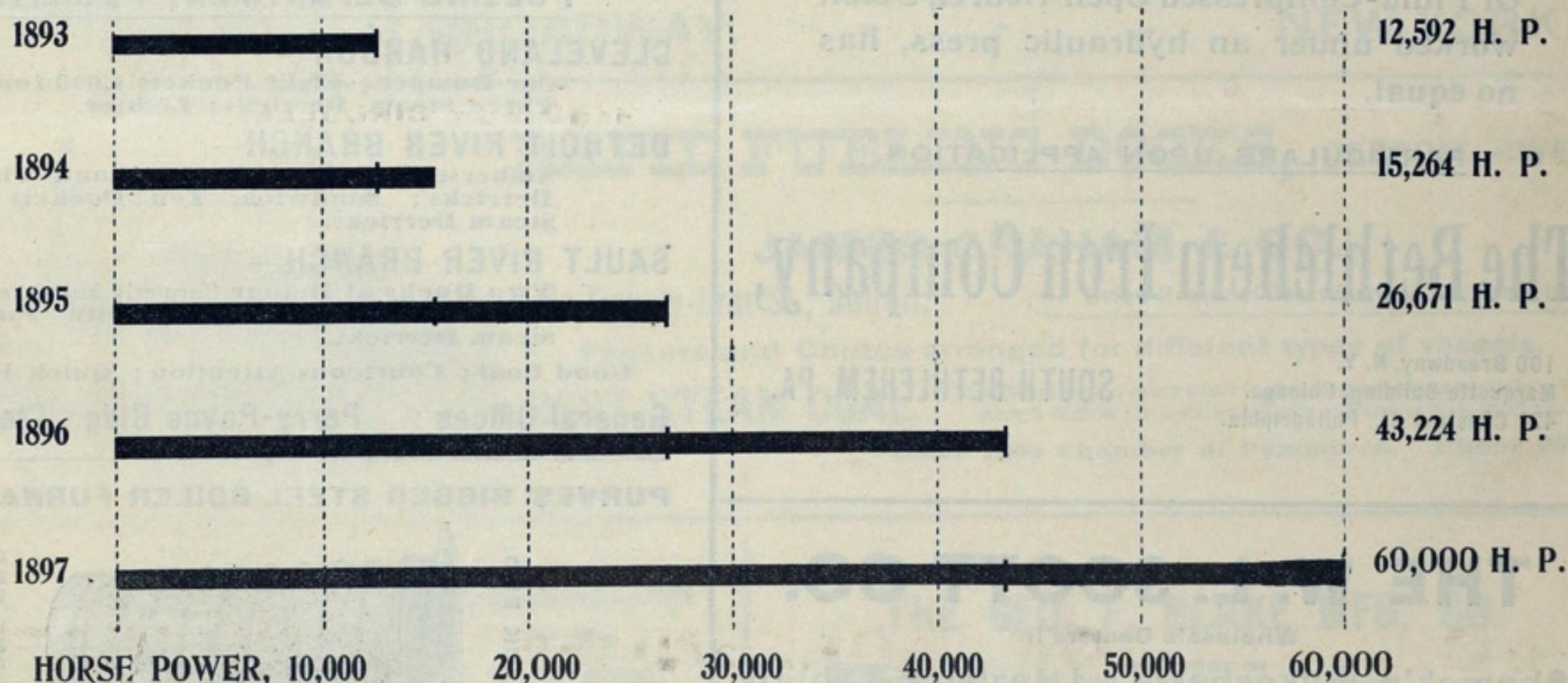
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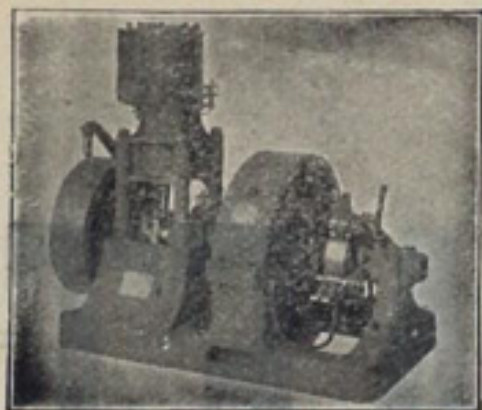
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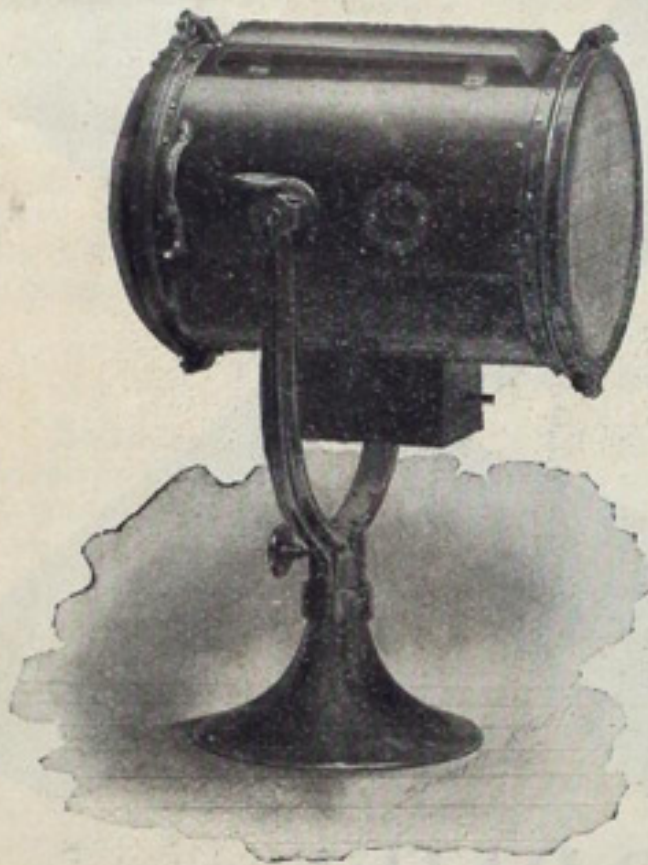
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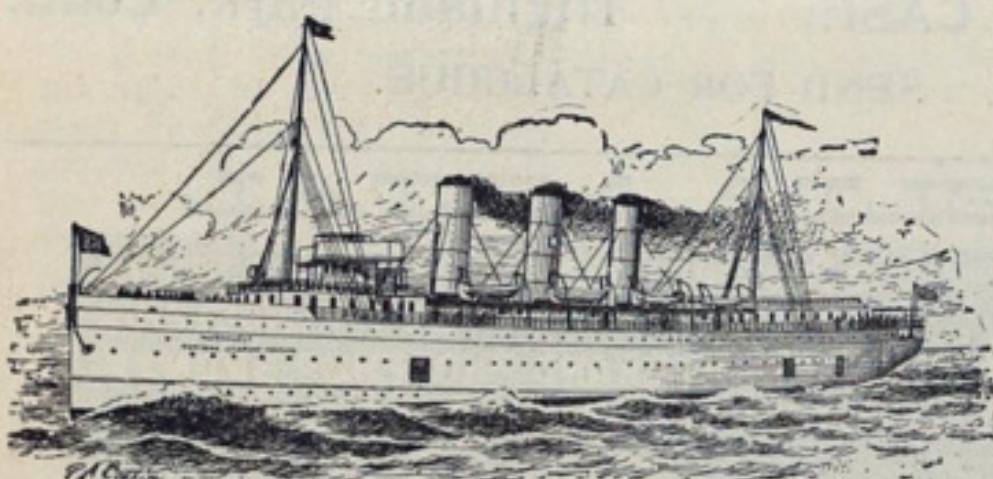
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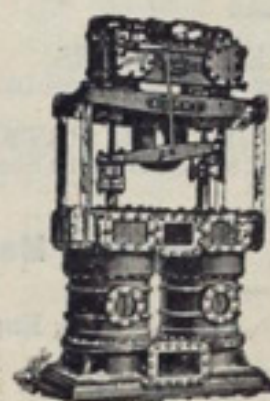
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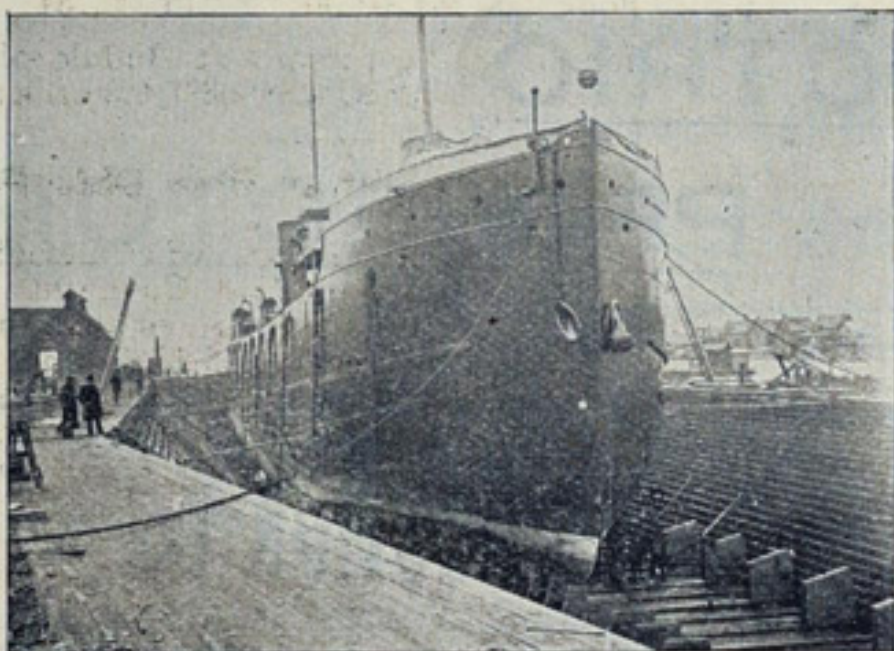
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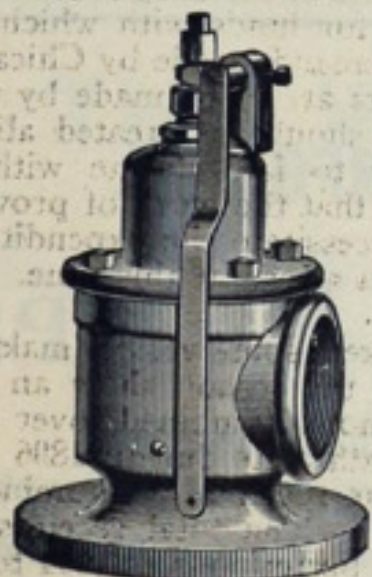
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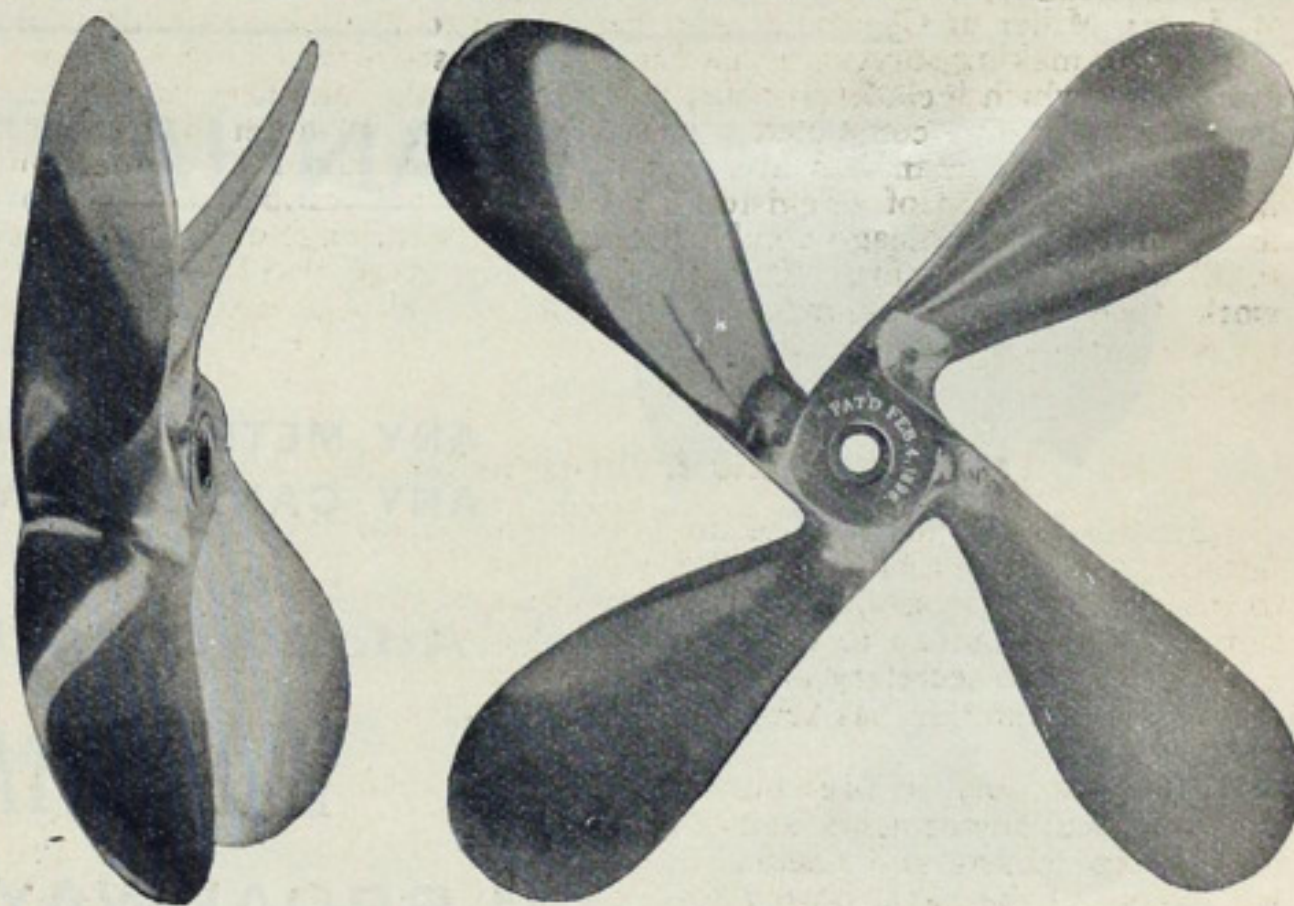
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